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A Haunting Spectre

Archaeological Studies of Social Organisation, Economic Practice, and Inequality

A Festschrift for Johannes Müller
on the occasion of his 65th birthday

2025

J. Kneisel, M. Furholt, R. Hofmann,
D. Mischka, W. Kirleis, M. Wunderlich (eds.)

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Edited by ***Jutta Kneisel, Martin Furholt, Robert Hofmann, Doris Mischka, Wiebke Kirleis, Maria Wunderlich***

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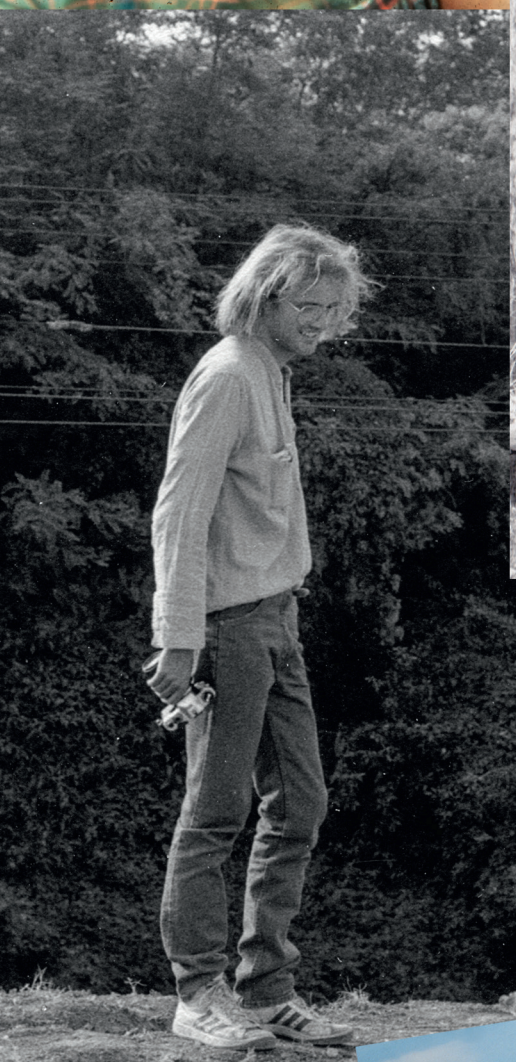

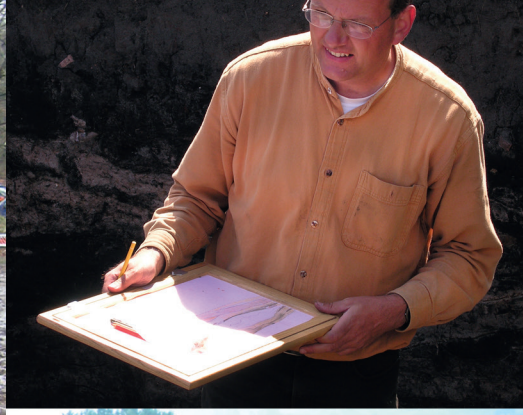

UAM

Curriculum Vitae

Johannes Müller, Prof. Dr. Dr. h.c. (1960)*

Academia

Academia profile (https://uni-kiel.academia.edu/JohannesM%C3%BCller)

EDUCATION

1998 PD (Habilitation), Prehistoric Archaeology, Free University Berlin, Germany (Mentor: B. Hänsel): *Soziochronologische Studien zum Jung- und Spätneolithikum im Mittelelbe-Saale-Gebiet (4100–2700 v. Chr.). Eine sozialhistorische Interpretation prähistorischer Quellen*

1990 PhD (Dr. phil.), Prehistoric Archaeology, Freiburg University, Germany (Supervisor: C. Strahm): *Das ostadriatische Frühneolithikum: Die Impresso-Kultur und die Neolithisierung des Adriaraumes*

1986 MA (Magister artium), Freiburg University, Germany, in Prehistoric and Protohistoric Archaeology (Supervisor: C. Strahm): *The Chambered Cairns of the Northern and Western Isles Structure and Geography*

1980 – 1986 Studies of Prehistoric and Protohistoric Archaeology, Soil Science and Economic and Social History, University of Freiburg, Germany, and University of Edinburgh, UK

ACADEMIC CAREER

2025 Doctor Honoris Causa of Adam Mickiewicz University in Poznań

2004 – pres. Professor of Prehistoric Archaeology (chair) and Director at Kiel University

2000 – 2004 Professor of Archaeology (chair) and Director at University of Bamberg

1999 Substitution of the Professorship of Prehistoric Archaeology, University of Freiburg

1998 Substitution of the Professorship of Cultural Information Science, University of Cologne

1993 – 1999 Associate Professor at Free University Berlin

1990 – 1993 Post-doctoral research fellow at Freiburg University

FELLOWSHIPS AND AWARDS (SELECTION)

2023 Shanghai Archaeology Forum SAF Research Award in the category "Field Discovery" for his research into the oldest urban structures in Europe

2020 Riksbankens Jubileumsfond 30th Swedish Research Awards from RJ to outstanding German scholars

2019 Shanghai Archaeology Forum SAF Research Award for the research on "Early Monumentality and Social Differentiation in Neolithic Europe"

2019 Adam-Mickiewicz-University Medal of Merit for Polish-German Research Collaboration

2010 Invited Senior Scholar, New York State University Buffalo

2009 Invited Senior Scholar, University Autonoma Barcelona

2007– pres. Fellow of the German Archaeological Institute

1998 Heisenberg-Fellow, German Research Foundation (DFG)

1990 –1991 Travel Scholarship, German Archaeological Institute (DAI)

PI AND SPEAKER OF COLLABORATIVE RESEARCH GRANTS (SELECTION)

2025 – 2032 Cluster of Excellence, EXC 2150 "ROOTS – Social, Environmental, and Cultural Connectivity in Past Societies", DFG, PI
2021 – 2026 synERC "XSCAPES", ERC, PI
2019 – 2025 Cluster of Excellence, EXC 2150 "ROOTS – Social, Environmental, and Cultural Connectivity in Past Societies", DFG, PI and speaker
2016 – 2025 Collaborative Research Centre, CRC 1266 "Scales of Transformation: Human-environmental Interaction in Prehistoric and Archaic Societies", DFG, PI and speaker
2015 – 2022 Únětice North: "Late Neolithic/Early Bronze Age developments in the south-west Baltic area (2500–1500 BC)", DFG/ARN, PI in collaboration with Poznań University
2012 – 2018 Excellence Initiative Graduate School "Human Development in Landscapes, second phase", DFG, PI and speaker
2009 – 2016 Priority Program (SPP 1400) "Early Monumentality and Social Differentiation", DFG, PI and speaker
2011 – 2012 Exchange Program "Archaeology of Prehistoric Eastern Spain" (in collaboration with Barcelona University), DAAD
2009 – 2012 Marie Curie research training networks project "Forging Identities: the Mobility of Culture in Bronze Age Europe". ERC, PI, member of the project leadership
2008 – 2011 "Archaeophysics (Summer schools)", ESF, PI
2005 – 2011 "Early Bronze Age Bruszczewo", Polish-German Foundation, PI

PI OF FURTHER PROJECTS (SELECTION)

2021 "International Conference EAA", Wenner Gren Grand
2016 – 2024 "Neolithic Transformations on the Northern Central European Plain", DFG-CRC 1266
2016 – 2024 "Population Agglomerations in Tripolye-Cucuteni Mega-sites", DFG-CRC 1266
2016 – 2024 "Social Dimensions of Technological Change", DFG-CRC 1266
2016 – 2020 "Theories of Transformation in Prehistoric and Archaic Societies", DFG-CRC 1266
2009 – 2018 "Coordination Priority Program Funnel Beaker", DFG-SPP 1400
2013 – 2017 "Equality and Inequality: North Central Europe 4300–2400 BCE", DFG-SPP 1400
2013 – 2017 "Social Space at the Boundary Loess / Moraine Haldensleben Region", DFG-SPP 1400
2009 – 2017 "Demography, Communication and Traditional Space in Funnel Beaker Societies", DFG-SPP 1400
2009 – 2017 "Monumental Enclosures / Megalithic Burials of Neolithic Schleswig-Holstein", DFG-SPP 1400
2009 – 2017 "Megaliths and Domestic Sites in FBC East Holstein (3500–2700 BC)", DFG-SPP 1400
2006 – 2012 "Megaliths of the Western Altmark: Middle Neolithic Domestic Patterns with Megaliths", DFG
2008 – 2010 "Settlement Hierarchies, Cultural Space, and Territoriality in SW-Germany 800–300 BC", DFG
2005 – 2011 "The Reconstruction of Late Neolithic Settlement Processes in Central Bosnia", DFG
2005 "International Workshop: Environment-Economy-Settlement 3000–2000BC", DFG
2003 – 2005 "Rituals and Landscape: Final Neolithic to Iron Age in Franconia", Oberfranken Foundation
2002 – 2005 Graduate Group „Generation Consciousness and Conflicts inAncient History", DFG
2000 – 2004 "Chronology and Innovation: Neolithic to Bronze Age in Central Germany", DFG
1999 – 2003 "Settlement Behavior and Landscape: Predictive Mapping Brandenburg", Thyssen
1995 – 1997 "Social Development and Chronology in Central Germany", DFG

ORGANISATION OF INTERNATIONAL AND LARGE CONFERENCES (SELECTION)

2025, 2023, 2019, 2017, 2015, 2013, 2011, 2009 Kiel
International Conference "Socio-environmental Change During the Last 12000 Years" (https://www.kielconference.uni-kiel.de/?page_id=3689)

2021 Kiel
27th Annual Meeting of the European Association of Archaeologists – "Widening Horizons"
2020 Kiel
Deutscher Archäologie Kongress
2018 Kiel
International Workshop of CRC 1266 "Habitus, the Social Dimension of Technology and Transformation"
2018 Kiel
International Bellbeaker Workshop of CRC 1266 "Think Global, Act Local!"
2018 Kohima (India)
International Workshop – Dialogues with the Past. Nordic Graduate School in Archaeology
"Building Big? Global Scales of Monumentality – An Ethno-archaeological Perspective"
2012 Aarhus
Forging Identities "The Mobility of Culture in Bronze Age Europe"

ACADEMY MEMBERSHIPS

2020 "Honorary Research Associate" McDonald Institute for Archaeological Research at the University of Cambridge (UK)
2019 – 2023 Elected head of the 'Zentraldirektion' of the German Archaeological Institute (DAI), Berlin, Germany
2018 – pres. Member of the DFG-Senate Committee on Research Training Groups
2018 / 2020 Member of the ERC starting grant panel
2014 – pres. Board Member (since 2021 head) of the European project "Megalithic Routes"
2013 – 2021 Board Member of the Nordic Graduate School "Dialogues with the Past"
2012 – 2018 Member of the Romano-Germanic Commission (RGK) of the German Archaeological Institute (DAI), Berlin, Germany
2007–2023 Member of the Scientific Board of Centre for Baltic and Scandinavian Archaeology (ZBSA), Schleswig, Germany
2005–2024 Member of the Board of the Leibniz Laboratory for Radiometric Dating and Isotope Research, Kiel University, Germany
2004– pres. Institute of Balkan Studies, Academy, Sarajevo, Bosnia-Herzegovina
2002–2012 Member of the Review Board of "Ancient Cultures" of the German Research Foundation (DFG)
Panel member of review boards Leibniz Society, DFG

PUBLISHING

Journal and Series Editor
Journal of Neolithic Archaeology (JungsteinSite); Offa; Sprawozdania Archaeologiczne
Editor of publishing series: Archäoprognose; Frühe Monumentalität und soziale Differenzierung (20 volumes); Offa-Bücher; Studien zur Archäologie in Ostmitteleuropa (20 volumes); Universitätsforschungen zur prähistorischen Archäologie, Scales of Transformation in Prehistoric and Archaic Societies (21 volumes); ROOTS Studies (7 volumes)

Member of Editorial Board
Archäologisches Korrespondenzblatt, Journal of Archaeological Research

Liste der Publikationen von Johannes Müller (Stand Oktober 2025) / *List of Publications by Johannes Müller (as of October 2025)*

Außer eigenen Aufsätzen und Monographien werden im Rahmen der Forschungstätigkeit verschieden Reihen und Zeitschriften herausgegeben. Neben den üblichen Printmedien sind zur Zeit online-Publikationen wichtig. Bewusst verfolgt der Lehrstuhl das Prinzip des open access.

Herausgeberschaft von Zeitschriften: Archäologisches Korrespondenzblatt (Redaktion); *Journal of Neolithic Archaeology* (JungsteinSite); Offa; Sprawozdania Archaeologiczne. Allgemeine Zeitung des jugendlichen Archäologie Verbandes.

Herausgeberschaft von Reihen: Archäoprognose; Frühe Monumentalität und soziale Differenzierung; Offa-Bücher; Studien zur Archäologie in Ostmitteleuropa; Universitätsforschungen zur Prähistorischen Archäologie.

BOOKS

In press

Hofmann, R., Kirleis, W., Müller, J., Rud, V., Terna, S. and Videiko, M., eds., 2024. *From Ros to Prut: Transformations of Trypillia settlements*, Scales of Transformation in Prehistoric and Archaic Societies 19.1. Leiden: Sidestone Press. Available at:. https://doi.org/10.59641/j9n462cl

Hofmann, R., Kirleis, W., Müller, J., Rud, V., Terna, S. and Videiko, M., eds., 2024. *From Ros to Prut: Transformations of Trypillia settlements*, Scales of Transformation in Prehistoric and Archaic Societies 19.2. Leiden: Sidestone Press. https://doi.org/10.59641/kao351dm

2024

Kirleis, W., Müller, J. and Reuter, A.E., eds., 2024. *Alles bleibt anders: Transformationsprozesse in Raum und Zeit*, Scales of Transformation in Prehistoric and Archaic Societies. Leiden: Sidestone Press. https://doi.org/10.59641/ukz351nw

Müller, J., Kirleis, W. and Taylor, N., eds., 2024. *Perspectives on Socio-environmental Transformations in Ancient Europe*, Quantitative Archaeology and Archaeological Modelling. Cham: Springer. https://doi.org/10.1007/978-3-031-53314-3

2023

Müller, J., 2023. *Separation, hybridisation, and networks: Globular Amphora sedentary pastoralists ca. 3200–2700 BCE*, Scales of Transformation in Prehistoric and Archaic Societies 17. Leiden: Sidestone Press. https://doi.org/10.59641/a0e4613c

2022

Dębiec, M., Górski, J., Müller, J., Nowak, M., Pelisiak, A., Saile, T. and Wlodarczak, P., eds., 2022. *From Farmers to Heroes? Archaeological Studies in Honor of Sławomir Kadrow*, Universitätsforschung zur prähistorischen Archäologie 376. Bonn: Habelt.

Müller, J., ed., 2022. *Connectivity Matters! Social, environmental and cultural connectivity in Past Societies*, ROOTS Studies 2. Leiden: Sidestone Press. https://doi.org/10.59641/8yc6831a

2020

Furholt, M., Cheben, I., Müller, J., Bistáková, A., Wunderlich, M. and Müller-Scheeßel, N., eds., 2020. *Archaeology in the Žitava Valley I: The LBK and Želiezovce settlement site of Vráble*, Scales of Transformation in Prehistoric and Archaic Societies 9. Leiden: Sidestone Press. https://doi.org/10.59641/j2790mv

Käppel, L., Makarewicz, C. and Müller, J., eds., 2020. *Distant Times So Close: Pandemics and Crises Reloaded*, ROOTS Booklet Series 1. Leiden: Sidestone Press. https://www.sidestone.com/books/pandemics-and-crises-reloaded

Käppel, L., Makarewicz, C. and Müller, J., eds. 2020. *Entfernte Zeiten so nah: Pandemien und Krisen*, ROOTS Booklet Series 1. Leiden: Sidestone Press. https://www.sidestone.com/books/pandemien-und-krisen

Müller, J., and Ricci, A., eds., 2020. *Past Societies: Human Development in Landscapes*. Leiden: Sidestone Press. https://www.sidestone.com/bookviewer/9789088909245

2019

Kadrow, S. and Müller, J., eds., 2019. *Habitus? The Social Dimension of Technology and Transformation*, Scales of Transformation in Prehistoric and Archaic Societies 3. Leiden: Sidestone Press. https://www.sidestone.com/books/habitus

Müller, J., Hinz, M. and Wunderlich, M., eds., 2019. *Megaliths – Societies – Landscapes: Early Monumentality and Social Differentiation in Neolithic Europe*, Frühe Monumentalität und soziale Differenzierung 18. Bonn: Habelt.

2018

Haug, A., Käppel, L. and Müller, J., eds., 2018. *Past Landscapes: The Dynamics of Interaction between Society, Landscape, and Culture*. Leiden: Sidestone Press. https://www.sidestone.com/bookviewer/9789088907319

2017

Hansen, S. and Müller, J., eds., 2017. *Rebellion and Inequality in Archaeology: Proceedings of the Kiel Workshops "Archaeology of Rebellion" (2014) and "Social Inequality as aTopic in Archaeology" (2015)*, Universitätsforschungen zur Prähistorischen Archäologie 308. Bonn: Habelt.

Müller, J., 2017. *Großsteingräber – Grabenwerke – Langhügel: Frühe Monumentalbauten Mitteleuropas*. Archäologie in Deutschland, Sonderheft 11. Darmstadt: Theiss.

Müller, J., Hofmann, R., Kirleis, W., Dreibrodt, S., Ohlrau, R., Brandstätter, L., Dal Corso, M., Out, W., Rassmann, K., Burdo, N. and Videko, M., eds., 2017. *Maidanetske 2013: New excavations at a Trypillia megasite*, Studien zur Archäologie in Ostmitteleuropa 16. Bonn: Habelt.

2016

Müller, J., Rassmann, K. and Videiko, M., eds., 2016. *Trypillia Mega-Sites and European Prehistory: 4100–3400 BCE*. London: Routledge. https://doi.org/10.4324/9781315630731

2015

Czebreszuk, J. and Müller, J., eds., 2015. *Bruszczewo III. The settlement and fortification in the mineral zone of the site*, Studien zur Archäologie in Ostmitteleuropa 13. Bonn: Habelt.

Czebreszuk, J., Müller, J., Jaeger, M. and Kneisel, J., eds., 2015. *Bruszczewo IV. Natural resources and economic activities of the Bronze Age people*, Studien zur Archäologie in Ostmitteleuropa 14. Bonn: Habelt.

Dörfler, W., Kirleis, W. and Müller, J., eds., 2015. *MEGALITHsite CAU: Ein Großsteingrab zum Anfassen*. Lübeck: Wachholtz.

2014

Müller, J., ed., 2014. *Denghoog – Großeibstadt – Rastorf: Studien zu neolithischen Gräbern und Häusern*, Frühe Monumentalität und soziale Differenzierung 5. Bonn: Habelt. https://doi.org/10.38071/2024-00731-7

Müller, J., ed., 2014. *Exploring Landscapes: The Reconstruction of Social Space – Landschaft erforschen: Sozialen Raum rekonstruieren. Investigations on Prehistorical and Historical Societies and the Environment*. Bonn: Habelt.

2013

Müller, J., Rassmann, K. and Hofmann, R., eds., 2013. *Okolište 1 – Untersuchungen einer spätneolithischen Siedlungskammer in Zentralbosnien*, Universitätsforschungen zur prähistorischen Archäologie 228 (Neolithikum und Chalkolithikum in Zentralbosnien 1). Bonn: Habelt.

2012

Hinz, M. and Müller, J., eds., 2012. *Siedlung, Grabenwerk, Großsteingrab: Studien zu Gesellschaft, Wirtschaft und Umwelt der Trichterbechergruppen im nördlichen Mitteleuropa: Studien zu Gesellschaft, Wirtschaft und Umwelt der Trichterbechergruppen im nördlichen Mitteleuropa*, Frühe Monumentalität und soziale Differenzierung 2. Bonn: Habelt.

Hofmann, R., Moetz, F.-K. and Müller, J., eds., 2012. *Tells: Social and Environmental Space. Proceedings of the International Workshop Socio-Environmental Dynamics over the Last 12,000 Years: The Creation of Landscapes II (14th–18th March 2011)" in Kiel. Volume 3*, Universitätsforschungen zur prähistorischen Archäologie 207. Bonn: Habelt.

2011

Furholt, M., Lüth, F. and Müller, J., eds., 2011. *Megaliths and Identities: Early Monuments and Neolithic Societies from the Atlantic to the Baltic*, Frühe Monumentalität und soziale Differenzierung 1. Bonn: Habelt. https://doi.org/10.38071/2024-00727-4

Hansen, S. and Müller, J., eds., 2011. *Sozialarchäologische Perspektiven: Gesellschaftlicher Wandel 5000–1500 v. Chr. zwischen Atlantik und Kaukasus*, Archäologie in Eurasien 24. Mainz: Philipp von Zabern.

Müller, J., 2011. *Megaliths and Funnel Beakers: Societies in Change 4100–2700 BC*, Kroon-Vordaacht 13. Amsterdam: Stichting Nederlands Museum voor Anthropologie en Praehistorie.

Hildebrandt-Radke, I., Dörfler, W., Czebreszuk J. and Müller, J., eds., 2011. *Anthropogenic Pressure in the Neolithic and the Bronze Age on the Central European Lowlands,* Studien zur Archäologie in Ostmitteleuropa 8. Bonn: Habelt.

2010

Kiel Graduate School "Human Development in Landscapes", Workshop and Session Organizers, eds., 2010. *Landscapes and Human Development: The Contribution of European Archaeology. Proceedings of the International Workshop "Socio-Environmental Dynamics over the last 12,000 Years: The Creation of Landscapes (1st–4th April 2009)"*, Universitätsforschungen zur prähistorischen Archäologie 191. Bonn: Habelt.

Müller, J., Czebreszuk, J. and Kneisel, J., eds., 2010. *Bruszczewo II. Ausgrabungen und Forschungen in einer prähistorischen Siedlungskammer Großpolens*, Studien zur Archäologie in Ostmitteleuropa 6. Bonn: Habelt.

2008

Czebreszuk, J., Kadrow, S. and Müller, J., eds., 2008. *Defensive Structures from Central Europe to the Aegean in the 3rd and 2nd millennia BC*, Studien zur Archäologie in Ostmitteleuropa 5. Bonn: Habelt.

Dörfler, W. and Müller, J., eds., 2008. *Umwelt – Wirtschaft – Siedlungen im dritten vorchristlichen Jahrtausend Mitteleuropas und Südskandinaviens*, Offa-Bücher 84. Neumünster: Wachholtz.

Müller, J. and Seregély, T., eds., 2008. *Wattendorf-Motzenstein – eine schnurkeramische Siedlung auf der nördlichen Frankenalb: Naturwissenschaftliche Ergebnisse und Rekonstruktion des schnurkeramischen Siedlungswesens in Mitteleuropa*, Universitätsforschungen zur prähistorischen Archäologie 155, Endneolithische Siedlungsstrukturen in Oberfranken II. Bonn: Habelt.

2007

Kunow, J., Müller, J. and Schopper, F., eds., 2007. *Archäoprognose Brandenburg II*, Forschungen zur Archäologie im Land Brandenburg 10. Wünsdorf: Brandenburgisches Landesamt für Denkmalpflege/Archäologisches Landesmuseum.

2005

Hofmann, R. and Müller, J., eds., 2005. *Axt und Rad en miniature: Aussergewöhnliche Zeugnisse der späten Jungsteinzeit vom Motzenstein bei Wattendorf.* Tüchersfeld: Fränkische-Schweiz-Museum.

Müller, J., ed., 2005. *Alter und Geschlecht in ur- und frühgeschichtlichen Gesellschaften.Tagung Bamberg 20.–21. Februar 2004*, Universitätsforschungen zur Prähistorischen Archäologie 126. Bonn: Habelt.

2004

Czebreszuk, J. and Müller, J., eds., 2004. *Bruszczewo I. Ausgrabungen und Forschungen in einer prähistorischen Fundregion Großpolens. Forschungsstand – Erste Ergebnisse – Das östliche Feuchtbodenareal*, Studien zur Archäologie in Ostmitteleuropa 2. Rahden/Westfalen: Verlag Marie Leidorf.

Kunow, J. and Müller, J., eds., 2004. *Landschaftsarchäologie und Geographische Informationssysteme / The Archaeology of Landscapes and Geographic Information Systems. Prognosekarten, Besiedlungsdynamik und prähistorische Raumordnungen / Predictive Maps, Settlement Dynamics and Space and Territory in Prehistory,* Archäoprognose Brandenburg 1, Forschungen zur Archäologie im Land Brandenburg 8. Wünsdorf: Brandenburgisches Landesamt für Denkmalpflege.

2002

Müller, J., ed., 2002. *Endneolithikum und Frühbronzezeit – Muster sozialen Wandels? Tagungsband des Symposiums Bamberg 2001*, Universitätsforschungen zur Prähistorischen Archäologie 90. Bonn: Habelt.

Müller, J., Hoffmann, R. and Peek, T., eds., 2002. *„Ötzi – sein Leben, seine Zeit" Oberfranken am Ende der Jungsteinzeit.* Begleitheft zur Sonderausstellung im Fränkische Schweiz-Museum Tüchersfeld vom 28.06.–03.11.2002. Tüchersfeld: Fränkische-Schweiz-Museum.

2001

Czebreszuk, J. and Müller, J., eds., 2001. *Die absolute Chronologie in Mitteleuropa 3000–2000 v. Chr. / The Absolute Chronology of Central Europe 3000–2000 BC*, Studien zur Archäologie in Ostmitteleuropa 1. Rahden/Westfalen: Verlag Marie Leidorf.

Marciniak, A., Müller, J. and Raczkowski, W., eds., 2001. *Archaeology an archaeological science*, Archaeologia Polona 39. Warschau: Institute of Archaeology and Ethnology, Polish Academy of Science.

Müller, J., 2001. *Soziochronologische Studien zum Jung- und Spätneolithikum im Mittelelbe-Saale-Gebiet (4100–2700 v. Chr.): eine sozialhistorische Interpretation prähistorischer Quellen*, Vorgeschichtliche Forschungen 21 (Habilitationsschrift Berlin 1997). Rahden/Westfalen: Verlag Marie Leidorf.

1997

Fritsch, B., Maute, M., Matuschik, I., Müller, J. and Wolf, C., eds., 1997. *Tradition und Innovation: Prähistorische Archäologie als historische Wissenschaft. Festschrift Christian Strahm*, Internationale Archäologie 3 – Studia honoraria 3. Espelkamp: Verlag Marie Leidorf.

Müller, J. and Zimmermann, A., eds., 1997. *Archäologie und Korrespondenzanalyse: Beispiele, Fragen, Perspektiven*, Internationale Archäologie 23. Espelkamp: Verlag Marie Leidorf.

1996

Müller, J. and Bernbeck, R., eds., 1996. *Prestige – Prestigegüter – Sozialstrukturen: Beispiele aus dem europäischen und vorderasiatischen Neolithikum*, Archäologische Berichte 6. Heidelberg: Propylaeum. https://doi.org/10.11588/propylaeum.1

1994

Müller, J., 1994. *Das Ostadriatische Frühneolithikum: Die Impresso-Kultur und die Neolithisierung des Adriaraumes*, Prähistorische Archäologie Südosteuropas 9. Berlin: Wissenschaftverlag Volker Spies.

1988

Müller, J., 1988. *The chambered cairns of the Northern and Western Isles – architecture, geography and information transfer*, Occasional Paper of the Department of Archaeology Edinburgh 16. Edinburgh: University of Edinburgh Department of Archaeology.

ARTICLES

2025

An, J., Chevalier, A., Brozio, J.P., Müller, J. and Kirleis. W., 2025. Functional exploration of grinding and polishing stones from the Neolithic settlement site of Oldenburg LA 77, Northern Germany – evidence from plant microfossil analysis. *Journal of Archaeological Science: Reports* 61, 104913. https://doi.org/10.1016/j.jasrep.2024.104913

Müller, J. and Czebreszuk, J., 2025. Burial mounds and the social practices of the Central European Early Bronze Age. *In:* H. Wrobel Nørgaard and S. Reiter, eds. *Bronzization*. Essays in Bronze Age Archaeology. Oxford: Archaeopress, 325–332. https://archaeopress.com:443/Archaeopress/Products/9781803279213

2024

Czebreszuk, J., Müller, J., Szmyt, M., Goslar, T., Jaeger, M., Hildebrandt-Radke, I., Niebieszczański, J., Gmińska-Nowak, B., Ważny, T., Kneisel, J., Krause-Kyora, B.F., Makowiecki, D., Rewekant, A., Kotova, N., Rennwanz, J. and Raese, H., 2024. Chronology and social significance of the "princely" barrow cemetery in Łęki Małe and the Central European Early Bronze Age. *PLoS ONE* 19(5), e0300591. https://doi.org/10.1371/journal.pone.0300591

Duffy, P.R., Wilkes, F., Skorna, H., Furholt, M., Dickie, C.F., Furholt, K., Bilotti, G., Müller, J. and Feinman, G.M., 2024. Five Thousand Years of Inequality in the Carpathian Basin. *Research Square: Preprint*. https://doi.org/10.21203/rs.3.rs-4844801/v1

Fuchs, K., Hofmann, R., Shatilo, L., Schlütz, F., Storch, S., Chabanyuk, V., Kirleis, W., Müller, J., 2024. Life and death in Trypillia times: Interdisciplinary analyses of the unique human remains from the settlement of Kosenivka, Ukraine (3700–3600 BCE). *PLoS ONE* 19(12), e0289769. https://doi.org/10.1371/journal.pone.0289769

Hofmann, R., Müller-Scheeßel, N. and Müller, J., 2024. Trypillia mega-sites: A social levelling concept? *Antiquity* 98(398), 380–400. https://doi.org/10.15184/aqy.2024.18

Kirleis, W., Dal Corso, M., Pashkevych, G., Schlütz, F., Hofmann, R., Terna, A., Dreibrodt, S., Rud, V., Videiko, M. and Müller, J., 2024. A complex subsistence regime revealed for Cucuteni–Trypillia sites in Chalcolithic eastern Europe based on new and old macrobotanical data. *Vegetation History and Archaeobotany* 33(1), 75–90. https://doi.org/10.1007/s00334-023-00936-y

Kirleis, W. and Müller, J., 2024. New Perspectives on Socio-environmental Transformations in Past Societies. *In siehe: Müller et al. 2024*, 1–7. https://doi.org/10.1007/978-3-031-53314-3_1

Kneisel, J., Czebreszuk, J., Kirleis, W. and Müller, J., 2024. Aus den Augen, aus dem Sinn: Bronzezeitliches Abfallmanagement im Jahr 1800 v. Chr. *In:* J. Schneeweiß, ed. *Wertvolle Abfallgeschichten: Wurzeln der Kreislaufwirtschaft*, ROOTS Booklet Series 4. Leiden: Sidestone Press, 34–41. https://doi.org/10.59641/c1f7z8a9b0

Kneisel, J., Czebreszuk, J., Kirleis, W. and Müller, J., 2024. Out of Sight Is Out of Mind: Bronze Age Waste Management – Back to the Year 1800 BCE. *In:* J. Schneeweiß, ed. *Stories of Waste and Value: Roots of a Circular Economy*, ROOTS Booklet Series 4. Leiden: Sidestone Press, 34–41. https://doi.org/10.59641/b0e6y7z8a9

Kubiak-Martens, L., Oudemans, T.F.M., Brozio, J.P., Filipović, D., Müller, J. and Kirleis, W., 2024. Transformation of cereal grains: Botanical and chemical analysis of food residues encrusted on pottery from the Funnel Beaker settlement of Oldenburg LA 77, northern Germany. *PLoS ONE* 19(1), e0296986. https://doi.org/10.1371/journal.pone.0296986

Marzian, J., Laabs, J., Müller, J. and Requate, T., 2024. Inequality in relational wealth within the upper societal segment: evidence from prehistoric Central Europe. *Humanities and Social Sciences Communications* 11, 557. https://doi.org/10.1057/s41599-024-03053-x

Müller, J., Bilotti, G., Skorna, H., Wilkes, F., Kruckenberg, C., Duffy, P., Hofmann, R. and Kneisel, J., 2024. The monopolisation of violence: booms and busts of prehistoric violence linked to social inequalities. *Research Square: Preprint*. https://doi.org/10.21203/rs.3.rs-4904279/v1

Müller, J., Kirleis, W., Kneisel, J. and Rabbel, W., 2024. Overarching Patterns of Ancient Transformation in Europe. *In siehe: Müller et al. 2024*, 343–367. https://doi.org/10.1007/978-3-031-53314-3_10

Schlütz, F., Hofmann, R., Müller, J. and Kirleis, W., 2024. Pflanzliche Proteine ermöglichten die ersten stadtgroßen Siedlungen der Welt, gesellschaftliche Spannungen führten zu ihrem Zerfall. *Christiana Albertina: Forschungen und Berichte aus der Christian-Albrechts-Universität zu Kiel* 85, 89–99. https://doi.org/10.38072/2942-2337/p24

Susat, J., Haller-Caskie, M., Bonczarowska, J.H., da Silva, N.A., Schierhold, K., Rind, M.M., Schmölcke, U., Kirleis, W., Sondermann, H., Rinne, C., Müller, J., Nebel, A. and Krause-Kyora, B., 2024. Neolithic Yersinia pestis infections in humans and a dog. *Communications Biology* 7, 1013. https://doi.org/10.1038/s42003-024-06676-7

Taylor, N., Rinne, C., Brozio, J.P., Kneisel, J., Wieckowska-Lüth, M., Kleijne, J., Gorbahn, H.G., Kirleis, W. and Müller, J., 2024. Scales of Abstraction: The Kiel Conceptual Approach from Heterogeneous Data to Interpretations. *In siehe: Müller et al. 2024*, 11–33. https://doi.org/10.1007/978-3-031-53314-3_2

Standall, E. A., Craig, O. E., Kneisel, J., Müller, J., Kirleis, W., Czebreszuk, J. and Heron, C. P. 2024. Millet and meals: The role and significance of Panicum miliaceum in culinary contexts at Bruszczewo, Poland. *Archaeological and Anthropological sciences* 17. https://doi.org/10.1007/s12520-024-02095-1

2023

Brozio, J.P., Feeser, I., Heumüller, M., Müller, J., Corradini, E., Kirleis, W., Dörfler, W., Erkul, E. and Wunderlich, T., 2023. Hunte 4: Re-validation of a Bell Beaker domestic site in the Dümmer region in northwestern Germany. *Praehistorische Zeitschrift* 98(1), 24–61. https://doi.org/10.1515/pz-2022-2020

Brozio, J.P., Stos-Gale, Z., Müller, J., Müller-Scheeßel, N., Schultrich, S., Fritsch, B., Jürgens, F. and Skorna, H., 2023. The origin of Neolithic copper on the central Northern European plain and in Southern Scandinavia: Connectivities on a European scale. *PLoS ONE* 18(5), e0283007. https://doi.org/10.1371/journal.pone.0283007

Da Silva, N.A., Özer, O., Haller, M., Chen, Y.-R., Kolbe, D., Schade-Lindig, S., Wahl, J., Berszin, C., Francken, M., Görner, I., Schierhold, K., Pechtl, J., Grupe, G., Rinne, C., Müller, J., Lenz, T.L., Nebel, A. and Krause-Kyora, B., 2023. Admixture as a source for HLA variation in Neolithic European farming communities. *Genome Biology* 26, 43. https://doi.org/10.1101/2023.08.23.554285

Golea, M., García-Vázquez, A., Mircea, C., Cârciumaru, M., Sava, G., Müller, J., Kirleis, W. and Lazăr, C., 2023. Revisiting Archived Rye Grains Discovered at the Neolithic Site Cuneşti (Romania). *Radiocarbon* 65(3), 771–788. https://doi.org/10.1017/RDC.2023.22

Großmann, R., Weinelt, M. and Müller, J., 2023. Demographic dynamics between 5500 and 3500 calBP (3550–1550 BCE) in selected study regions of Central Europe and the role of regional climate influences. *PLoS ONE* 18(10), e0291956. https://doi.org/10.1371/journal.pone.0291956

Haak, W., Furholt, M., Sikora, M., Rohrlach, A.B., Papac, L., Sjögren, K.G., Heyd, V., Fischer Mortensen, M., Nielsen, A.B., Müller, J., Feeser, I., Kroonen, G. and Kristiansen, K., 2023. The Corded Ware Complex in Europe in Light of Current Archaeogenetic and Environmental Evidence. *In:* K. Kristiansen, G. Kroonen and E. Willerslev, eds. *The Indo-European Puzzle Revisited. Integrating Archaeology, Genetics, and Linguistics*. Cambridge: Cambridge University Press, 63–80. https://doi.org/10.1017/9781009261753.009

Krause-Kyora, B.F., Susat, J., Haller-Caskie, M., Bonczarowska, J.H., da Silva, N.A., Schierhold, K., Rind, M., Schmölcke, U., Kirleis, W., Rinne, C., Müller, J. and Nebel, A., 2023. Neolithic humans and dogs – transient reservoirs for Yersinia pestis. *Research Square*. https://doi.org/10.21203/rs.3.rs-3745869/v1

Müller, J., 2023. Cattle and Wagons – The First "Wild West" in Europe? The Wheel Innovation in the Baltic-Pontic Region 3500–2500 BCE. *In:* H. Piezonka, L. Käppel and A. Ricci, eds. *ROOTS of Routes: Mobility and Networks between the Past and the Future*, ROOTS Booklet Series 2. Leiden: Sidestone Press, 64–66. https://doi.org/10.59641/y1811bk

Müller, J., 2023. Landscape Archaeology and Socio-Environmental Patterns. *In:* E. Nikita and T. Rehren, eds. *Encyclopedia of Archaeology*. Amsterdam: Elsevier, 383–399. https://doi.org/10.1016/B978-0-323-90799-6.00189-0

Müller, J., 2023. Trypillia Mega-sites: Planned Cityscape? *In:* M. Frangipane, ed. *The 'city' across time: Emergence, developments, and social, economicpolitical, cultural and health impact*, Atti dei Convegni Lincei 354. Rome: Bardi Edizioni, 117–140.

Müller, J., 2023. Uni-kulturell oder multi-kulturell? Zur Chronologie, Bedeutung und Rolle Bernburgs im mitteldeutschen Neolithikum. *In:* Landesmuseum für Vorgeschichte Halle, ed. *Die Bernburger Kultur: Neue Funde, Befunde und Ideen*. Halle (Saale): Landesmuseum für Vorgeschichte Halle, 11–66.

Müller, J., Delgado-Raack, S., Escanilla, N., Kienle, L., Kneisel, J., Czebreszuk, J., Jaeger, M., Szmyt, M. and Schürmann, U., 2023. First Evidence for the Forging of Gold in an Early Bronze Age Site of Central Europe (2200–1800 BCE). *Journal of Archaeological Science: Reports* 47, 103748. https://doi.org/10.1016/j.jasrep.2022.103748

Müller, J., Hofmann, R., Schlütz, F., Sîrbu, G., Heghea, S., Țerna, A., Fuchs, K., Shatilo, L.O. and Kirleis, W., 2023. Trinca-La Șanț – A Large North Moldovan Trypillia Settlement. *Journal of Neolithic Archaeology* 25, 243–262. https://doi.org/10.12766/jna.2023.9

Müller-Scheeßel, N., Hukeľová, Z., Cheben, I., Müller, J. and Furholt, M., 2023. Kopflose Skelette und aufgebahrte Leichen: Die Toten der bandkeramischen Siedlung von Vráble / Südwestslowakei im Vergleich mit gleichzeitigen Kollektiven. *In:* N. Balkowski, K.P. Hofmann, I.A. Hohle and A. Schülke, eds. *Mensch – Körper – Tod: Der Umgang mit menschlichen Überresten im Neolithikum Mitteleuropas*. Leiden: Sidestone Press, 177–201. https://doi.org/10.59641/kaf31bd9

Schlütz, F., Hofmann, R., Dal Corso, M., Pashkevych, G., Dreibrodt, S., Shatilo, M., Terna, A., Fuchs, K., Filipovic, D., Flohr, P., Makarewicz, C., Terna, S., Videiko, M., Rud, V., Müller, J. and Kirleis, W., 2023. Isotopes prove advanced, integral crop production, and stockbreeding strategies nourished Trypillia mega-populations. *Proceedings of the National Academy of Sciences of the United States of America* 120(52), e2312962120. https://doi.org/10.1073/pnas.2312962120

Scholtus, L. and Müller, J., 2023. European settlement demography: a boom and bust pattern in prehistory? *Documenta Praehistorica* 50, 22–34. https://doi.org/10.4312/dp.50.22

Sjögren, K.G., Blank, M., Ahlström, T., Axelsson, T., Dreibrodt, S. and Müller, J., 2023. Tiarp Backgården. An Early Neolithic Dolmen in Falbygden, Sweden and Early Megalithic Tombs in South Scandinavia and Northern Central Europe. *Journal of Neolithic Archaeology* 25, 213–241. https://doi.org/10.12766/jna.2023.8

Zolchow, M., Pickartz, N., Serbanescu, A., Erkul, E., Köhn, D., Wilken, D., Dreibrodt, S., Hofmann, R., Müller, J., Lazar, C. and Rabbel, W., 2023. First results from stratigraphic investigation of Chiselet tell (Romania) using seismic full waveform inversion. *In:* T. Wunderlich, H. Hadler and R. Blankenfeldt, eds. *Advances in On- and Offshore Archaeological Prospection: Proceedings of the 15th International Conference on Archaeological Prospection*. Kiel: Universitätsverlag Kiel, 315–318. https://doi.org/10.38072/978-3-928794-83-1/p63

2022

Diachenko, A., Ohlrau, R. and Müller, J., 2022. The answer is blowing in the wind: Wind direction inscribed in burnt houses as chronological proxy. *In siehe: Dębiec et al. 2022*, 187–196.

Dreibrodt, S., Hofmann, R., Corso, M.D., Bork, H.-R., Duttmann, R., Martini, S., Saggau, P., Schwark, L., Shatilo, L., Videiko, M., Nadeau, M.-J., Grootes, P. M., Kirleis, W. and Müller, J., 2022. Earthworms, Darwin and prehistoric agriculture-Chernozem genesis reconsidered. *Geoderma* 409, 115607. https://doi.org/10.1016/j.geoderma.2021.115607

Krause-Kyora, B., Torres, G., Da Silva, N., Kolbe, D., Dose, J., Schade-Lindig, S., Wahl, J., Berszin, C., Francken, M., Görner, I., Schierhold, K., Pechtl, J., Grupe, G., Caliebe, A., Müller, J., Schreiber, S. and Nebel, A., 2022. Ancient implications for today's precision medicine: How the first Near East farmers shaped the European genetic risk architecture for IBD. *Research Square*. https://doi.org/10.21203/rs.3.rs-2075746/v1

Makarewicz, C., Hofmann, R., Videiko, M.V. and Müller, J., 2022. Community negotiation and pasture partitioning at the Trypillia settlement of Maidanetske. *Antiquity* 96(388), 831–847. https://doi.org/10.15184/aqy.2022.32

Mohanty, R.K. and Müller, J., 2022. Megaliths from India and Southeastern Asia: Introduction. *In:* L Laporte, J.-M. Large, L. Nespoulous, C. Scarre and T. Steimer-Herbet, eds. *Megaliths of the World*. Oxford: Archaeopress, 415–418. https://doi.org/10.32028/9781803273204

Müller, J., 2022. A long lasting transformation: northern Late Mesolithic/Early Neolithic multi-dimensional developments (c. 4,750 – 3,800 BCE). *In:* F. Klimscha, M. Heumüller, D.C.M. Raemaekers, H. Peeters and T. Terberger, eds. *Stone Age Borderland Experience: Neolithic and Late Mesolithic Parallel Societies in the North European Plain*, Materialhefte zur Ur- und Frühgeschichte Niedersachsens 60, Veröffentlichungen der archäologischen Sammlungen des Landesmuseums Hannover 54. Rahden/Westfalen: Verlag Marie Leidorf, 359–376. https://doi.org/10.11588/diglit.66745.27

Müller, J., 2022. Funnel Beaker Societies and Long-Distance Trade. *In:* J. Ling, R.J. Chacon and K. Kristiansen, eds. *Trade Before Civilization: Long-Distance Exchange and the Rise of Social Complexity*. Cambridge: Cambridge University Press, 23–39. https://doi.org/10.1017/9781009086547.003

Müller, J., 2022. Rituelle Landschaften entstehen: Trichterbecher-Gesellschaften und die Neolithisierung der nordeuropäischen Tiefebene. *In:* F. Klimscha and L. Wiggering, eds. *Die Erfindung der Götter: Steinzeit im Norden*. Petersberg: Michael Imhof Verlag, 246–265.

Müller, J., Hofmann, R. and Shatilo, M., 2022. Tripolye Mega-Sites: "Collective Computational Abilities" of Prehistoric Proto-Urban Societies? *Journal of Social Computing* 3(1), 75–90. https://doi.org/10.23919/JSC.2021.0034

Müller, J., Hofmann, R., Videiko, M. and Burdo, N., 2022. Nebelivka – rediscovered: A Lost City. *In siehe: Dębiec et al. 2022,* 213–222.

Müller, J., Käppel, L., Ricci, A. and Weinelt, M., 2022. Social, environmental, and cultural connectivity: A concept for an understanding of society and the environment. *In siehe: Müller 2022,* 13–24. https://doi.org/10.59641/8yc6831a

Müller, J. and Sjögren, K.-G., 2022. Early monumentality in northern Europe. *In:* L. Laporte, J.-M. Large, L. Nespoulous, C. Scarre and T. Steimer-Herbet, eds. *Megaliths of the World*. Oxford: Archaeopress, 1213–1233. https://doi.org/10.32028/9781803273204

Müller, J. and Sjögren, K.-G., 2022. Les débuts de la monumentalité en Europe du Nord. *In:* L. Laporte, J.-M. Large, L. Nespoulous, C. Scarre and T. Steimer-Herbet, eds. *Mégalithes dans le monde*. Chauvigny: Editions Chauvinoises, 1235–1257.

Pickartz, N., Rabbel, W., Rassmann, K., Hofmann, R., Ohlrau, R., Thorwart, M., Wilken, D., Wunderlich, T., Videiko, M. and Müller, J., 2022. Inverse Filtering of Magnetic Prospection Data: A Gateway to the Social Structure of Cucuteni-Tripolye Settlements? *Remote Sensing* 14(3), 484. https://doi.org/10.3390/rs14030484

2021

Brozio, J P., Hellmann, J.P., Filipovic, D., Schmölcke, U., Kirleis, W. and Müller, J., 2021. Der Wohnplatz 15 (Labenz LA 11): Vorbericht zu einem Fundplatz aus dem 3. vorchristlichen Jahrtausend im Duvenseer Moor. *Offa Berichte und Mitteilungen zur Urgeschichte, Frühgeschichte und Mittelalterarchäologie* 73–77 (2016–2020), 23–53. https://doi.org/10.26016/offa.2020.A2

Constant, A., Tschantz, A.D.D., Millidge, B., Criado-Boado, F., Martinez, L.M., Müller, J. and Clark, A., 2021. The Acquisition of Culturally Patterned Attention Styles Under Active Inference. *Frontiers in Neurorobotics* 15 (2021). https://doi.org/10.3389/fnbot.2021.729665

Immel, A., Pierini, F., Rinne, C., Meadows, J., Barquera, R., Szolek, A., Susat, J., Böhme, L., Dose, J., Bonczarowska, J.H., Drummer, C.A., Fuchs, K., Ellinghaus, D., Kässens, J.C., Furholt, M., Kohlbacher, O., Schade-Lindig, S., Franke, A., Schreiber, S., Krause, J., Müller, J., Lenz, T.L., Nebel, A. and Krause-Kyora, B., 2021. Genome-wide study of a Neolithic Wartberg grave community reveals distinct HLA variation and hunter-gatherer ancestry. *Communications Biology* 4(1), 113. https://doi.org/10.1038/s42003-020-01627-4

Müller, J., 2021. Das 3. vorchristliche Jahrtausend: ein Zeitalter der Globalisierung. *In:* LWL-Museum für Archäologie, Westfälisches Landesmuseum und das Ludwig Boltzmann Institut für Archäologische Prospektion und Virtuelle Archäologie, D. Mölders, M.M. Rind, K. Schierhold, W. Neubauer and J. Richards, eds. *Stonehenge: Von Menschen und Landschaften*. Petersberg: Michael Imhof Verlag, 78–91.

Müller, J., 2021. Integration, mobility, migration. *In:* V. Heyd, G. Kulcsár and B. Preda-Bălănică, eds. *Yamnaya Interactions: Proceedings of the International Workshop held in Helsinki, 25–26 April 2019,* The Yamnaya Impact on Prehistoric Europe 2. Budapest: Archaeolinga, 47–56.

Müller-Scheeßel, N., Hukeľová, Z., Meadows, J., Cheben, I., Müller, J. and Furholt, M., 2021. New burial rites at the end of the Linearbandkeramik in south-west Slovakia. *Antiquity* 95(379), 65–84. https://doi.org/10.15184/aqy.2020.103

Pickartz, N.M., Hofmann, R., Wunderlich, T., Rassmann, K., Müller, J., Ohlrau, R., Wilken, D. and Rabbel, W., 2021. Magnetization Patterns as Indicator of Settlement Structures. *ArcheoSciences* 45(45), 187–190. https://doi.org/10.4000/archeosciences.9500

Rassmann, K., Furholt, M., Müller-Scheeßel, N. and Müller, J., 2021. The social organisation of the Vinča culture settlements: New evidence from magnetic and archaeological excavation data. *In:* M. Radivojević, B.W. Roberts, M. Marić, J. Kuzmanović Cvetković and T. Rehren, eds. *The Rise of Metallurgy in Eurasia: Evolution, Organisation and Consumption of Early Metal in the Balkans*. Oxford: Archaeopress, 455–459. https://doi.org/10.32028/9781803270425

Wunderlich, M., Jamir, T., Müller, J., Rassmann, K. and Vasa, D., 2021. Societies in balance: Monumentality and feasting activities among southern Naga communities, Northeast India. *PLoS ONE* 16(3), e0246966. https://doi.org/10.1371/journal.pone.0246966

2020

Constant, A., Tschantz, A., Millidge, B., Criado-Boado, F., Martinez, L.M., Müller, J. and Clark, A., 2020. The Acquisition of Culturally Patterned Attention Styles under Active Inference. *Preprint: PsyArXiv.* https://doi.org/10.31234/osf.io/rchaf

Delgado-Raack, S., Kneisel, J., Czebreszuk, J. and Müller, J., 2020. Manufacture, use and management of macro-lithic resources in the Bronze Age settlement of Bruszczewo (Poland). *Journal of Lithic Studies* 7(3). https://doi.org/10.2218/jls.3080

Dreibrodt, S., Hofmann, R., Sipos, G., Schwark, L., Videiko, M., Shatilo, L., Martini, S., Saggau, P., Bork, H.-R., Kirleis, W., Duttmann, R. and Müller, J., 2020. Holocene soil erosion in Eastern Europe-land use and/or climate controlled? The example of a catchment at the Giant Chalcolithic settlement at Maidanetske, central Ukraine. *Geomorphology* 367(367), 107302. https://doi.org/10.1016/j.geomorph.2020.107302

Furholt, M., Eckelmann, R., Filipović, D., Gillis, R.E. and Müller, J., 2020. Patterns of subsistence at the LBK and Želiezovce settlement site of Vráble. *In siehe: Furholt et al. 2020,* 503–510. https://www.sidestone.com/bookviewer/9789088908972

Furholt, M., Müller-Scheeßel, N., Wunderlich, M., Cheben, I. and Müller, J., 2020. Communality and Discord in an Early Neolithic Settlement Agglomeration: The LBK Site of Vráble, Southwest Slovakia. *Cambridge Archaeological Journal* 30(3), 469–489. https://doi.org/10.1017/S0959774320000049

Immel, A., Țerna, S., Simalcsik, A., Susat, J., Šarov, O., Sîrbu, G., Hofmann, R., Müller, J., Nebel, A. and Krause-Kyora, B., 2020. Gene-flow from steppe individuals into Cucuteni-Trypillia associated populations indicates long-standing contacts and gradual admixture. *Scientific Reports* 10(1), 4253. https://doi.org/10.1038/s41598-020-61190-0

Käppel, L., Makarewicz, C. and Müller, J., 2020. Consequences: Diversity and Personal Responsibility. *In siehe: Käppel et al. 2020*, 56–57. https://www.sidestone.com/books/pandemics-and-crises-reloaded

Käppel, L., Makarewicz, C. and Müller, J., 2020. Pandemics, Crises and Solutions: The Past in the Future. *In siehe: Käppel et al. 2020,* 6–7. https://www.sidestone.com/books/pandemics-and-crises-reloaded

Kleijne, J.P., Weinelt, M. and Müller, J., 2020. Late Neolithic and Chalcolithic maritime resilience? The 4.2ka BP event and its implications for environments and societies in Northwest Europe. *Environmental Research Letters* 15(12), 125003. https://doi.org/10.1088/1748-9326/aba3d6

Kneisel, J., Müller, J. and Czebreszuk, J., 2020. Bruszczewo in Großpolen: Eine bronzezeitliche befestigte Zentralsiedlung. *Archäologische Nachrichten Schleswig-Holstein* 26. https://www.ansh2020.de/de/br_bruszczewo-in-greater-poland

Müller, J., 2020. Population Agglomeration and the "Bubonic Plague": The Earliest European Cities around 3800 BCE. *In siehe: Käppel et al. 2020*, 26–29. https://www.sidestone.com/books/pandemics-and-crises-reloaded

Müller, J., 2020. Unterschiedliche Formen der Machtrepräsentation: Okolište – Maidanetske – Bruszczewo. *In:* S. Hansen, ed. *Repräsentationen der Macht: Beiträge des Festkolloquiums zu Ehren des 65. Geburtstages von Blagoje Govedarica*, Kolloquien zur Vor- und Frühgeschichte 25. Wießbaden: Harrassowitz Verlag, 97–108.

Müller, J., 2020. Upheaval against Social Order: A Solution? Lessons from Neolithic and Iron Age Europe. *In siehe: Käppel et al. 2020*, 30–31. https://www.sidestone.com/books/pandemics-and-crises-reloaded

Müller, J., Brozio, J.P., Dörfler, W. and Kirleis, W., 2020. Narratives of 3rd-millennium transformations: New biographies of Neolithic societies, landscapes and monuments. *In:* A.B. Gebauer, L. Sørensen, A. Teather and A.C. Valera, eds. *Monumentalizing life in Neolithic Europe: Narratives of continuity and change*. Oxford: Oxbow Books, 115–124.

Müller, J., Kirleis, W. and Hofmann, R., 2020. Europas erste Metropolen. *Spektrum der Wissenschaft* 11, 79–86. https://www.spektrum.de/magazin/europas-erste-metropolen/1773726

Müller, J., Müller-Scheeßel, N., Cheben, I., Wunderlich, M. and Furholt, M., 2020. On the demographic development of the LBK and Želiezovce settlement sites of Vráble and the Upper Žitava Valley. *In siehe: Furholt et al. 2020*, 493–502. https://doi.org/10.59641/j2790mv

Müller, J. and Ricci, A., 2020. Introduction: Concepts of Human Developments in Landscapes: A Structured Research. *In siehe: Müller and Ricci 2020,* 9–12.

Müller, J. and Ricci, A., 2020. Preface. *In siehe: Müller and Ricci 2020,* 7–8. https://www.sidestone.com/bookviewer/9789088909245

Müller, J. and Vandkilde, H., 2020. The Nordic Bronze Age Rose from Copper Age Diversity: Contrasts in the Cimbrian Peninsula. *In:* K.I. Austvoll, M.H. Eriksen, P.D. Fredriksen, L. Melheim, L. Prøsch-Danielsen and L. Skogstrand, eds. *Contrasts of the Nordic Bronze Age: Essays in Honour of Christopher Prescott*. Turnhout: Brepols Publishers, 29–48. https://doi.org/10.1484/M.TANE-EB.5.120581

Müller-Scheeßel, N., Müller, J., Cheben, I., Mainusch, W., Rassmann, K., Rabbel, W., Corradini, E. and Furholt, M., 2020. A new approach to the temporal significance of house orientations in European Early Neolithic settlements. *PLoS ONE* 15(1), e0226082. https://doi.org/10.1371/journal.pone.0226082

Pickartz, N., Rabbel, W., Rassmann, K., Müller-Scheeßel, N., Furholt, M., Müller, J., Cheben, I., Wilken, D., Wunderlich, T. and Dreibrodt, S., 2020. What over 100 drillings tell us: A new method for determining the Koenigsberger ratio of soils from magnetic mapping and susceptibility logging. *Archaeological Prospection* 27(4), 393–414. https://doi.org/10.1002/arp.1782

Staniuk, R., Jaeger, M., Kulcsar, G., Taylor, N. and Müller, J., 2020. Moving Bottom-up: The Case Study of Kakucs-Turján (Hungary) and its Implications for Studies of Multi-layered Bronze Age Settlements in the Carpathian Basin. *In:* A. Blanco-González and T.L. Kienlin, eds. *Current Approaches to Tells in the Prehistoric Old World*. Oxford: Oxbow, 57–72.

Terna, S., Rassmann, K., Vornicu-Ţerna, A. and Müller, J., 2020. The evolution of dual-chambered updraught kilns on the Cucuteni-Tripolye mega-sites in the 4th millennium BC: A view from Stolniceni. *Godišnjak* 48, 41–58. https://doi.org/10.5644/Godisnjak.CBI.ANUBiH-48.116

Weber, J., Brozio, J.P., Müller, J. and Schwark, L., 2020. Grave gifts manifest the ritual status of cattle in Neolithic societies of northern Germany, *Journal of Archaeological Science* 117, 105122. https://doi.org/10.1016/j.jas.2020.105122

Wunderlich, M., Müller, J., Cheben, I., Bistáková, A., Furholt, M. and Müller-Scheeßel, N., 2020. The political economy of the LBK and Želiezovce settlement site of Vráble. *In siehe: Furholt et al. 2020,* 511–531. https://doi.org/10.59641/j2790mv

2019

Brozio, J.P., Filipovic, D., Kirleis, W., Müller, J. and Schmölcke, U., 2019. The Dark Ages in the North? A transformative phase at 3000–2750 BCE in the western Baltic: Brodersby-Schönhagen and the Store Valby phenomenon. *Journal of Neolithic Archaeology* 2019(21), 103–146. https://doi.org/10.12766/jna.2019.6

Brozio, J.P., Filipovic, D., Schmölcke, U., Kirleis, W. and Müller, J., 2019. Mittel- bis jungneolithische Siedlungshinterlassenschaften zwischen 3300–2600 v. Chr. . Der Fundplatz Oldenburg LA 232 im Oldenburger Graben, Ostholstein. *Praehistorische Zeitschrift* 93(2), 185–224. https://doi.org/10.1515/pz-2018-0007

Brozio, J.P., Müller, J., Furholt, M., Kirleis, W., Dreibrodt, S., Feeser, I., Dörfler, W., Weinelt, M., Raese, H. and Bock, A., 2019. Monuments and economies: What drove their variability in the middle-Holocene Neolithic? *The Holocene* 29(10), 1558–1571. https://doi.org/10.1177/0959683619857227

Czebreszuk, J., Szmyt, M., Müller, J. and Ławniczak, M., 2019. Late Neolithic and Early Bronze Age settlement archaeology on the Oder and Vistula Rivers in north-west Poland. *In:* H. Meller, S. Friedrich, M. Küßner, H. Stäuble and R. Risch, eds. *Siedlungsarchäologie des Endneolithikums und der frühen Bronzezeit. 11. Mitteldeutscher Archäologentag vom 18. bis 20. Oktober 2018 in Halle (Saale)*, Tagungen des Landesmuseums für Vorgeschichte Halle 20. Halle (Saale): Landesamt für Denkmalpflege u. Archäologie Sachsen-Anhalt, Landesmuseum für Vorgeschichte, 807–822.

Dal Corso, M., Hamer, W., Hofmann, R., Ohlrau, R., Shatilo, L., Knitter, D., Dreibrodt, S., Saggau, P., Duttmann, R., Feeser, I., Knapp, H., Benecke, N., Videiko, M., Müller, J. and Kirleis, W., 2019. Modelling landscape transformation at the Chalcolithic Tripolye mega-site of Maidanetske (Ukraine): Wood demand and availability. *The Holocene* 29(10), 1622–1636. https://doi.org/10.1177/0959683619857229

Filipović, D., Brozio, J.P., Ditchfield, P., Klooß, S., Müller, J. and Kirleis, W., 2019. Middle-Neolithic agricultural practices in the Oldenburger Graben wetlands, northern Germany: First results of the analysis of arable weeds and stable isotopes. *The Holocene* 29(10), 1587–1595. https://doi.org/10.1177/0959683619857224

Filipović, D., Brozio, J.P., Kaczmarek, J., Müller, J. and Kirleis, W., 2019. Food transformed? Taphonomical investigation into a potentially symbolic role of crops at two Neolithic settlements in northern Germany. *Praehistorische Zeitschrift* 94(1), 31–59. https://doi.org/10.1515/pz-2019-0014

Hofmann, R., Müller, J., Shatilo, L., Videiko, M., Ohlrau, R., Rud, V., Burdo, N., Dal Corso, M., Dreibrodt, S. and Kirleis, W., 2019. Governing Tripolye: Integrative architecture in Tripolye settlements. *PLoS ONE* 14(9), e0222243. https://doi.org/10.1371/journal.pone.0222243

Immel, A., Rinne, C., Meadows, J., Barquera, R., Szolek, A., Pierini, F., Susat, J., Böhme, L., Dose, J., Bonczarowska, J.H., Drummer, C.A., Fuchs, K., Ellinghaus, D., Kässens, J.C., Furholt, M., Kohlbacher, O., Schade-Lindig, S., Mathieson, I., Franke, A., Krause, J., Müller, J., Lenz, T.L. and Krause-Kyora, B., 2019. Neolithic genomes reveal a distinct ancient HLA allele pool and population transformation in Europe. *bioRxiv*, 1–32. https://doi.org/10.1101/851188

Jaeger, M., Kirleis, W., Kiss, V., Kulcsár, G., Müller, J., Staniuk, R. and Taylor, N., 2019. Kakucs Archaeological Expedition. *In:* M. Jaeger, G. Kulcsár, N. Taylor and R. Staniuk, eds. *Kakucs-Turján: a Middle Bronze Age multi-layered fortified settlement in Central Hungary*, Studien zur Archäologie in Ostmitteleuropa / Studia nad Pradziejami Europy Środkowej 18. Bonn: Habelt, 13–21. https://www.researchgate.net/publication/331351670_Kakucs_Archaeological_Expedition

Kadrow, S. and Müller, J. 2019. Habitus? The social dimension of technology and transformation: An introduction. *In siehe: Kadrow and Müller 2019*, 11–14. https://www.sidestone.com/books/habitus

Kleijne, J., Weinelt, M. and Müller, J., 2019. Bell Beaker resilience? The 4.2ka BP event and its implications for environments and societies in Northwest Europe. *SocArXiv*. https://osf.io/preprints/socarxiv/pf3dx/ ; last access 25th January 2024

Knitter, D., Brozio, J.P., Hamer, W.B., Duttmann, R., Müller, J. and Nakoinz, O., 2019. Transformations and Site Locations from a Landscape Archaeological Perspective: The Case of Neolithic Wagrien, Schleswig-Holstein, Germany. *Land* 8(4), 68. https://doi.org/10.3390/land8040068

Knitter, D., Brozio, J.P., Dörfler, W., Duttmann, R., Feeser, I., Hamer, W., Kirleis, W., Müller, J. and Nakoinz, O., 2019. Transforming landscapes: Modeling land-use patterns of environmental borderlands. *The Holocene* 29(10), 1572–1586. https://doi.org/10.1177/0959683619857233

Müller, J., 2019. Boom and bust, hierarchy and balance: From landscape to social meaning – Megaliths and societies in Northern Central Europe. *In siehe: Müller et al. 2019*, 29–74.

Müller J., Czebreszuk J., Szmyt M. and Ławniczak M., 2019. Late Neolithic and Early Bronze Age settlement archaeology on the Oder and Vistula rivers in north-west Poland. *In:* H. Meller, S. Friederich, M. Küßner, H. Stäuble and R. Risch, eds. *Siedlungsarchäologie des Endneolithikums und der frühen Bronzezeit. 11. Mitteldeutscher Archäologentag vom 18.–20. Okt. 2018 in Halle (Saale)*, Tagungen des Landesmuseums für Vorgeschichte Halle 20. Halle (Saale): Landesamt für Denkmalpflege und Archäologie Sachsen-Anhalt, Landesmuseum für Vorgeschichte, 807–821.

Müller, J. and Diachenko, A., 2019. Tracing long-term demographic changes: The issue of spatial scales. *PLoS ONE* 14 (1), e0208739. https://doi.org/10.1371/journal.pone.0208739

Müller, J., Hinz, M. and Wunderlich, M., 2019. Diversified monuments: A chronological framework of the creation of monumental landscapes in prehistoric Europe. *In siehe: Müller et al. 2019*, 25–28.

Müller, J. and Kirleis, W., 2019. The concept of socio-environmental transformations in prehistoric and archaic societies in the Holocene: An introduction to the special issue. *The Holocene* 29(10), 1517–1530. https://doi.org/10.1177/0959683619857236

Müller, J. and Rassmann, K., 2019. Frühe Monumente – soziale Räume. Das neolithische Mosaik einer neuen Zeit. *In:* E. Bánffy, K.P. Hofmann and P. von Rummel, eds. *Spuren des Menschen. 800 000 Jahre Geschichte in Europa*. Darmstadt: WGB, 134–158.

Müller, J., Schmütz, K. and Rinne, C., 2019. Schiepzig Enclosures: Gaps in the Archaeological Record at the End of the Fifth Millennium BC in Northern Central Germany? *In:* R. Gleser and D. Hofmann, eds. *Contacts, Boundaries and Innovation in the fifth Millennium: Exploring Developed Neolithic Societies in Central Europe and Beyond*. Leiden: Sidestone Press, 267–288.

Rassmann, K. and Müller, J., 2019. Talianki. *In:* E. Bánffy, K.P. Hofmann and P. von Rummel, eds. *Spuren des Menschen. 800 000 Jahre Geschichte in Europa*. Darmstadt: WGB, 148–158.

Rud, V., Hofmann, R., Kosakivskyi, V., Zaitseva, O. and Müller, J., 2019. Trypillia megasites West of the River Southern Buh: Preliminary Results of Bilyi Kamin Site Investigation in 2018. *Journal of Neolithic Archaeology* 2019(21), 27–60. https://doi.org/10.12766/jna.2019.2

Stephens, L., Fuller, D., Boivin, N., Rick, T., Gauthier, N., Kay, A., Marwick, B., Armstrong, C.G., Barton, C.M., Denham, T., Douglass, K., Driver, J., Janz, L., Roberts, P., Rogers, J.D., Thakar, H., Altaweel, M., Johnson, A.L., Sampietro Vattuone, M.M., Aldenderfer, M., Archila, S., Artioli, G., Bale, M.T., Beach, T., Borrell, F., Braje, T., Buckland, P.I., Jiménez Cano, N.G., Capriles, J.M., Diez Castillo, A., Çilingiroğlu, Ç., Negus Cleary, M., Conolly, J., Coutros, P.R., Covey, R. A., Cremaschi, M., Crowther, A., Der, L., Di Lernia, S., Doershuk, J.F., Doolittle, W.E., Edwards, K.J., Erlandson, J.M., Evans, D., Fairbairn, A., Faulkner, P., Feinman, G., Fernandes, R., Fitzpatrick, S.M., Fyfe, R., Garcea, E., Goldstein, S., Goodman, R.C., Dalpoim Guedes, J., Herrmann, J., Hiscock, P., Hommel, P., Horsburgh, K.A., Hritz, C., Ives, J.W., Junno, A., Kahn, J.G., Kaufman, B., Kearns, C., Kidder, T.R., Lanoë, F., Lawrence, D., Lee, G.-A., Levin, M.J., Lindskoug, H.B., López-Sáez, J.A., Macrae, S., Marchant, R., Marston, J.M., Mcclure, S., Mccoy, M.D., Miller, A.V., Morrison, M., Motuzaite Matuzeviciute, G., Müller, J., Nayak, A., Noerwidi, S., Peres, T.M., Peterson, C.E., Proctor, L., Randall, A.R., Renette, S., Robbins Schug, G., Ryzewski, K., Saini, R., Scheinsohn, V., Schmidt, P., Sebillaud, P., Seitsonen, O., Simpson, I.A., Sołtysiak, A., Speakman, R.J., Spengler, R.N., Steffen, M.L., Storozum, M.J., Strickland, K.M., Thompson, J., Thurston, T.L., Ulm, S., Ustunkaya, M.C., Welker, M.H., West, C., Williams, P.R., Wright, D.K., Wright, N., Zahir, M., Zerboni, A., Beaudoin, E., Munevar Garcia, S., Powell, J., Thornton, A., Kaplan, J.O., Gaillard, M.-J., Klein Goldewijk, K. and Ellis, E., 2019. Archaeological assessment reveals Earth's early transformation through land use. *Science* 365 (6456), 897–902. https://doi.org/10.1126/science.aax1192

Terna, S., Vornicu-Țerna, A., Hofmann, R., Dal Corso, M., Shatilo, L.O., Vasilache-Curoșu, M., Rud, V., Knapp, H., Kirleis, W., Rassmann, K. and Müller, J., 2019. Stolniceni – Excavation results from the 2017 campaign. *Journal of Neolithic Archaeology* 2019(21), 209–282. https://doi.org/10.12766/jna.2019.9

Țerna, S., Rassmann, K., Vornicu-Țerna, A. and Müller, J., 2019. The evolution of dual-chambered updraught kilns on the Cucuteni-Tripolye mega-sites in the 4th millennium BC: a view from Stolniceni. *Godišnjak* 48, 41–58. https://doi.org/10.5644/Godisnjak.CBI.ANUBiH-48.116

Wunderlich, M.L.T., Müller, J. and Hinz, M., 2019. Diversified monuments: A chronological framework of the creation of monumental landscapes in prehistoric Europe. *In siehe: Müller et al. 2019*, 25–28.

Wunderlich, M.L.T., Jamir, T. and Müller, J., 2019. Hierarchy and Balance: The Role of Monumentality in European and Indian Landscapes: An Archaeological and Anthropological Perspective. *Journal of Neolithic Archaeology* 2019 (Special Issue 5), 13–26. https://doi.org/10.12766/jna.2019S.2

2018

Dal Corso, M., Out, W.A., Ohlrau, R., Hofmann, R., Dreibrodt, S., Videiko, M., Müller, J. and Kirleis, W., 2018. Where are the cereals? Contribution of phytolith analysis to the study of subsistence economy at the Trypillia site Maidanetske (c. 3900–3650 BCE), central Ukraine. *Journal of Arid Environments* 157, 137–148. https://doi.org/10.1016/j.jaridenv.2018.06.009

Hartz, S. and Müller, J., 2018. Spätneolithische Transformationsprozesse: Die Bedeutung von Quern-Neukirchen LA 28 (Tegelbarg) für die Rekonstruktion einer Übergangszeit. *Offa Berichte und Mitteilungen zur Urgeschichte, Frühgeschichte und Mittelalterarchäologie* 71/72, 149–154.

Haug, A. and Müller, J., 2018. From Theories, Concepts and Practices on Human Development in Landscapes. *In siehe: Haug et al. 2018*, 13–16.

Hofmann, R., Shatilo, L.O., Ohlrau, R., Dal Corso, M., Dreibrodt, S., Videiko, M., Rassmann, K., Kirleis, W. and Müller, J., 2018. Tripolye – Strategy and Results of an ongoing Ukrainian-European Project. *Vita Antiqua* 2018(10), 146–154. https://doi.org/10.37098/2519-4542-2018-1-10-146-154

Jaeger, M., Staniuk, R.H., Müller, J., Kulcsár, G. and Taylor, N., 2018. History of the Bronze Age Habitation. *In:* M. Jaeger, G. Kulcsár, N. Taylor and R. Staniuk, eds. *Kakucs-Turján: A Middle Bronze Age multi-layered fortifed settlement in Central Hungary*, Studien zur Archäologie in Ostmitteleuropa / Studia nad Pradziejami Europy Środkowej, 18. Bonn: Habelt, 97–118.

Jaeger, M., Kirleis, W., Kiss, V., Kulcsár, G., Müller, J., Staniuk, R. and Taylor, N., 2018. Kakucs Archaeological Expedition. *In:* M. Jaeger, G. Kulcsár, N. Taylor and R. Staniuk, eds. *Kakucs-Turján: A Middle Bronze Age multi-layered fortifed settlement in Central Hungary*, Studien zur Archäologie in Ostmitteleuropa / Studia nad Pradziejami Europy Środkowej, 18. Bonn: Habelt, 13–25.

Kleijne, J., Furholt and M., Müller, J., 2018. Think global, act local! Bell Beakers in Europe. Proceedings of the Bell Beaker Workshop Kiel 2017. *Journal of Neolithic Archaeology (*Special edition 4). https://www.jna.uni-kiel.de/index.php/jna/issue/view/34

Müller, J., 2018. Landscape and the GSHDL 2007 2017: Ten Years of Research. *In siehe: Haug et al. 2018*, 17–36. https://www.sidestone.com/bookviewer/9789088907319

Müller, J., 2018. Social memories and site biographies: construction and perception in nonliterate societies. *In:* C. Bakels, Q. Bourgeois, D. Fontijn and R. Jansen, eds. *Local communities in the Big World of prehistoric Northwest Europe*, Analecta Praehistorica Leidensia 49. Leiden: Sidestone Press, 9–17.

Müller, J., 2018. The Disentanglement of Landscapes: Remarks on Concepts of Socio-Environmental Research and Landscape Archaeology. *In siehe: Haug et al. 2018*, 39–52. https://www.sidestone.com/bookviewer/9789088907319

Müller, J., Hofmann, R., Ohlrau, R. and Shatilo, M., 2018. The social constitution and political organisation of Tripolye mega-sites: Hierarchy and balance. *In:* H. Meller, D. Gronenborn and R. Risch, eds. *Überschuss ohne Staat: Politische Formen in der Vorgeschichte*, Tagungen des Landesmuseum für Vorgeschichte Halle 18. Halle (Saale): Landesamt für Denkmalpflege und Archäologie Sachsen-Anhalt, 247–262.

Terberger, T., Burger, J., Lüth, F., Müller, J. and Piezonka, H., 2018. Step by step: The neolithisation of Northern Central Europe in the light of stable isotope analyses. *Journal of Archaeological Science* 99, 66–86. https://doi.org/10.1016/j.jas.2018.08.004

Videiko M., Hofmann R., Ohlrau R., Rassmann K., Müller J., Kirleis W., Dreibrodt S. and Dal Corso, M., 2018. Tripolye – Strategy and Results of an ongoing Ukrainian-European Project. *Vita Antiqua* 10, 146–154. DOI:10.37098/2519-4542-2018-1-10-146-154

2017

Brozio, J.P., Dörfler, W., Eriksen, B.V., Grimm, S., Groß, D., Hartz, S., Kirleis, W., Kneisel, J., Lübke, H., Meadows, J., Müller, J. and Schmölcke, U., 2017. TransformationsDimensionen – Wildbeuter, Bodenbauer und frühe Metallurgen im Fokus: Sonderforschungsbereich 1266: Ein neues Großprojekt der Universität Kiel. *Archäologische Nachrichten Schleswig-Holstein* 2016(22), 18–21.

Hansen, S. and Müller, J., 2017. Rebellion and Inequality in Archaeology: An Introduction. *In siehe: Hansen and Müller 2017*, 19–22.

Hartz, S. and Müller, J., 2017. Einfach nur zwei große Töpfe? Zur Bedeutung zweier »Riesenbecher« aus Ostholstein. *Archäologische Nachrichten aus Schleswig-Holstein* 2017(23), 30–37.

Hartz, S. and Müller, J., 2017. Riesenbecher reloaded: Die mediale Bedeutung einer Fundkategorie und ein einzigartiger Kermikbefund von Göhl LA 142. *In:* B.V. Eriksen, A. Abegg-Wigg, R. Bleile and U. Ickerodt, eds. *Interaktion ohne Grenzen: Beispiele archäologischer Forschungen am Beginn des 21. Jahrhunderts*. Schleswig: Stiftung Schleswig-Holsteinische Landesmuseen Schloß Gottorf, 35–47.

Müller, J., 2017. Archäologie in Krisengebieten: Die soziale Praxis archäologischer Ausgrabungen. *In:* O. Auge and M. Göllnitz, eds. *Mit Forscherdrang und Abenteuerlust: Expeditionen und Forschungsreisen Kieler Wissenschaftlerinnen und Wissenschaftler*, Kieler Werkstücke Reihe A: Beiträge zur schleswig-holsteinischen und skandinavischen Geschichte 49. Frankfurt am Main: Peter Lang Edition, 247–256. https://doi.org/10.3726/b11205

Müller, J., 2017. From the Neolithic to the Iron Age – Demography and Social Agglomeration: The Development of Centralized Control? *In:* M. Fernández-Götz and D. Krausse, eds. *Eurasia at the Dawn of History: Urbanization and Social Change*. Cambridge: Cambridge University Press, 106–124. https://doi.org/10.1017/9781316550328.007

Müller, J., 2017. Rebellion and Inequality: Hierarchy and Balance. *In siehe: Hansen and Müller 2017*, 23–32.

Müller, J., 2017. Inheritance, population and social identities: Southeast Europe 5200–4300 BCE. *In:* M. Gori and M. Ivanova, eds. *Balkan Dialogues: Negotiating Identity between Prehistory and the Present*. London: Routledge, 156–168. https://doi.org/10.4324/9781315673875-9

Müller, J., Arponen, V., Hofmann, R. and Ohlrau, R., 2017. The Appearance of Social Inequalities: Cases of Neolithic and Chalcolithic Societies. *In:* A. Cardarelli, A. Cazzella and M. Frangipane, eds. *Origini. Preistoria e protostoria delle civiltà antiche – Prehistory and protohistory of ancient civilizations*. Thematic issue Origini – XXXVIII – Prehistory and protohistory of ancient civilizations 2015-2. Rome: Gangemi Editore, 65–83.

2016

Arponen, V.P.J., Müller, J., Hofmann, R., Furholt, M., Ribeiro, A., Horn, C. and Hinz, M., 2016. Using the Capability Approach to Conceptualise Inequality in Archaeology: the Case of the Late Neolithic Bosnian Site Okolište c. 5200–4600 BCE. *Journal of Archaeological Method and Theory* 23(2), 541–560. https://doi.org/10.1007/s10816-015-9252-0

Arponen, V.P.J., Müller, J. and Ohlrau, R., 2016. Artefacts, houses and inequality. *In:* H. Meller, H.P. Hahn, R. Jung and R. Risch, eds. *Arm und Reich – Zur Ressourcenverteilung in prähistorischen Gesellschaften. 8. Mitteldeutscher Archäologentag vom 22. bis 24. Oktober 2015 in Halle (Saale) / Rich and Poor – Competing for resources in prehistoric societies. 8th Archaeological Conference of Central Germany, October 22–24, 2015 in Halle (Saale)*, Tagungen des Landesmuseums für Vorgeschichte Halle 14. Halle (Saale): Landesamt für Denkmalpflege und Archäologie Sachsen-Anhalt, Landesmuseum für Vorgeschichte, 49–60.

Dörfler, W. and Müller, J., 2016. Rolling Stones auf dem Campus – Der Nachbau des Megalithgrabes von Wangels LA 69. *Archäologische Nachrichten* 22(2016), 132–137.

Heron, C., Shoda, S., Breu Barcons, A., Czebreszuk, J., Eley, Y., Gorton, M., Kirleis, W., Kneisel, J., Lucquin, A., Müller, J., Nishida, Y., Son, J. and Craig, O.E., 2016. First molecular and isotopic evidence of millet processing in prehistoric pottery vessels. *Scientific Reports* 6, 38767. https://doi.org/10.1038/srep38767

Hofmann, R., Diachenko, A. and Müller, J., 2016. Demographic trends and socio-economic dynamics: Some issues of correlation. *In:* S. Ţerna and B. Govedarica, eds. *Interactions, Changes and Meanings. Essays in honour of Igor Manzura on the occasion of his 60th birthday*. Chisinau: StratumPlus, 193–198.

Hofmann, R., Diachenko, A. and Müller, J., 2016. Демографические тенденции и динамика социально – экономического развития в преистории: некоторые проблемы корреляции. In: S. Ţerna and B. Govedarica, eds. *КУЛЬТУРНЫЕ ÂÂВВВИЯ, ДИНАМИКА И СМЫСЛЫ: Сборник статей честь 60-летия И. Â. Манзуры*. Chisinau: StratumPlus, 193–198.

Jaeger, M., Czebreszuk, J., Kneisel, J. and Müller, J., 2016. Human remains from the Early Bronze Age fortified settlement in Bruszczewo: Preliminay report. *In:* F. Gogaltan and S.-C. Ailincai, eds. *Settlements of Life and Death.Studies from Prehistory to Middle Ages: Proceedings of an International Colloquium Tulcea, 25th–28th of May 2016*. Cluj-Napoca: Editura MEGA, 51–70.

Müller, J., 2016. Demography and social agglomeration: Trypillia in a European perspective. *In siehe: Müller et al. 2016*, 7–16. https://doi.org/10.4324/9781315630731

Müller, J., 2016. From the Neolithic to the Iron Age – Demography and Social Agglomeration: The Development of Centralized Control? *In:* D. Krausse and M. Fernandez-Götz, eds. *Eurasia at the Dawn of History: Urbanization and Social Differentiation*. Cambridge: Cambridge University Press, 106–124.

Müller, J., 2016. Human Structure Social Space: What We Can Learn From Trypillia? *In siehe: Müller et al. 2016*, 301–304. https://doi.org/10.4324/9781315630731

Müller, J., Hofmann, R., Brandtstätter, L., Ohlrau, R. and Videiko, M., 2016. Chronology and Demography: How many people lived in a mega-site? *In siehe: Müller et al. 2016*, 133–170. https://doi.org/10.4324/9781315630731

Müller, J., Hofmann, R. and Ohlrau, R., 2016. From Domestic Households to Mega-Structures: Proto-Urbanism? *In siehe: Müller et al. 2016*, 253–268. https://doi.org/10.4324/9781315630731

Müller, J. and Pollock, S., 2016. Trypillia and Uruk. *In siehe: Müller et al. 2016*, 281–288. https://doi.org/10.4324/9781315630731

Müller, J. and Rassmann, K., 2016. Introduction. *In siehe: Müller et al. 2016*, 1–6. https://doi.org/10.4324/9781315630731

Müller, J. and Videiko, M., 2016. Maidanetske: New Facts of a Mega-Site. *In siehe: Müller et al. 2016*, 71–94. https://doi.org/10.4324/9781315630731

Müller, J. and Windler, A., 2016. Soziale Ungleichheit und die Entwicklung spätneolithischer und chalkolithischer Gesellschaften im westpontischen Raum. *In:* V. Nikolov and W. Schier, eds. *Der Schwarzmeerraum vom Neolithikum bis in die Früheisenzeit (6000–600 v. Chr.)*. Rahden: Marie Leidorf, 93–107.

Ohlrau, R., Dal Corso, M., Kirleis, W. and Müller, J., 2016. Living on the Edge? Carrying Capacities of Trypillian Settlements in the Buh-Dnipro Interfluve. *In siehe: Müller et al. 2016*, 207–220. https://doi.org/10.4324/9781315630731

Rassmann, K., Korvin-Piotrovskiy, A., Videiko, M. and Müller, J., 2016. The New Challenge for Site Plans and Geophysics: Revealing the Settlement Structure of Giant Settlements by Means of Geomagnetic Survey. *In siehe: Müller et al. 2016*, 29–45. https://doi.org/10.4324/9781315630731

2015

Arponen, V.P.J., Müller, J., Hofmann, R., Furholt, M., Ribeiro, A., Horn, C. and Hinz, M., 2015. Using the Capability Approach to Conceptualise Inequality in Archaeology: the Case of the Late Neolithic Bosnian Site Okolište c. 5200–4600 BCE. *Journal of Archaeolgical Method and Theory* 10(15), 1–20. doi10.1007/s10816-015-9252-0

Czebreszuk, J. and Müller, J., 2015. Early Bronze Age defensive settlement in Bruszczewo: Next step towards synthesis. *In siehe: Czebreszuk and Müller 2015*, 413–417.

Czebreszuk, J., Müller, J., Jaeger, M. and Kneisel, J., 2015. Absolute chronology of settlement. *In siehe: Czebreszuk et al. 2015*, 39–52.

Czebreszuk, J., Müller, J., Jaeger, M. and Kneisel, J., 2015. Final remarks. *In siehe: Czebreszuk et al. 2015*, 297–299.

Czebreszuk, J., Müller, J., Jaeger and M., Kneisel, J., 2015. Preface. *In siehe: Czebreszuk et al. 2015*, 9–10.

Czebreszuk, J., Müller and J., Kadrow, S., 2015. Preface from series' editors. *In siehe: Czebreszuk and Müller 2015*, 7–8.

De Cet, M., Duttmann, R., Lull, V., Micó, R., Müller, J., Rihuete Herrada, C., Risch and R., Verhagen, P., 2015. Agricultural territories and GIS modeling. The long-term term case study of Menorca, *In:* A. Traviglia, ed. *Across Space and Time. Papers from the 41st Annual Conference of Computer Applications and Quantitative Methods in Archaeology (CAA) Perth 25th–28th March 2013*. Amsterdam: Amsterdam University Press, 224–237.

Jaeger, M., Czebreszuk, J., Müller, J. and Kneisel, J., 2015. Metal finds. *In siehe: Czebreszuk et al. 2015*, 227–234.

Kneisel, J., Czebreszuk, J., Müller, J. and Jaeger, M., 2015. Excavations in season 2007–2008. *In siehe: Czebreszuk and Müller 2015*, 11–30.

Mitusov, A., Bork, H.-R. and Müller, J., 2015. *Geomorphometric regularities of the spatial distribution of colluvial deposits.* [Dissertation, Mathematisch-Naturwissenschaftliche Fakultät].

Müller, J., 2015. Bronze Age Social Practices: Demography and Economy Forging Long-Distance Exchange. *In:* P. Suchowska-Ducke, S.S. Reiter and H. Vandkilde, eds. *Forging Identities. The Mobility of Culture in Bronze Age Europe: Report from a Marie Curie Project 2009–2012 with Concluding Conference at Aarhus University, Moesgaard 2012*, BAR International Series 2771. Oxford: BAR Publishing, 225–230.

Müller, J., 2015. Crises – what crises? Innovation: Different approaches to climatic change around 2200 BCE. *In:* H. Meller, H.W. Arz, R. Jung and R. Risch, eds. *2200 BC – Ein Klimasturz als Ursache für den Zerfall der alten Welt: 7. Mitteldeutscher Archäologentag vom 23. bis 26. Oktober 2014 in Halle (Saale)*, Tagungen des Landesmuseums für Vorgeschichte Halle 12. Halle (Saale): Landesamt für Denkmalpflege und Archäologie Sachsen-Anhalt, Landesmuseum für Vorgeschichte, 651–667.

Müller, J., 2015. Eight Million Neolithic Europeans: Social Demography and Social Archaeology on the Scope of Change – from the Near East to Scandinavia. *In:* K. Kristiansen, L. Šmejda and J. Turek, eds. *Paradigm Found: Archaeological Theory – Present, Past and Future. Essays in Honour of Evžen Neustupný*. Oxford: Oxbow Books, 200–214. https://doi.org/10.2307/j.ctvh1dpc1.20

Müller, J., 2015. Von Johanna Mestorf zur Akademie – Die Rolle von Gesellschaft, Archäologie und Landschaft an der CAU. *In:* O. Auge, ed. *Christian-Albrechts-Universität zu Kiel 350 Jahre Wirken in Stadt, Land und Welt*. Kiel: Wachholtz, 748–774. https://macau.uni-kiel.de/receive/publ_mods_00001019?lang=de

Müller, J., 2015. Occupy time. *In:* K. Brink, K. Jennbert, L. Larsson and D. Olausson, eds. *Neolithic Diversities. Perspectives from a conference in Lund, Sweden*, Acta Archaeologica Lundensia Series 8(65). Lund: Department of Archaeology and Ancient History, Lund University, 153–163.

Müller, J., Hinz, M. and Ullrich, M., 2015. Bell Beakers – Chronology, Innovation and Memory: A Multivariate Approach. *In:* M.P.P. Martinez and L. Salanova, eds. *The Bell Beaker Transition in Europe: Mobility and local Evolution during the 3rd Millennium BC*. Oxford: Oxbow Books, 28–40. https://doi.org/10.5281/zenodo.1185599

Vandkilde, H., Hansen, S., Kotsakis, K., Kristiansen, K., Müller, J., Sofaer, J. and Sørensen, M.L.S., 2015. Cultural Mobility in Bronze Age Europe. P. Suchowska-Ducke, S.S. Reiter and H. Vandkilde, eds. Forging Identities. *The Mobility of Culture in Bronze Age Europe: Report from a Marie Curie Project 2009–2012 with Concluding Conference at Aarhus University, Moesgaard 2012*, BAR International Series 2771. Oxford: BAR Publishing, 5–37.

2014

Brozio, J.P., Dörfler, W., Feeser, I., Kirleis, W., Klooß, S. and Müller, J., 2014. A Middle Neolithic well from Northern Germany: A precise source to reconstruct water supply management, subsistence economy, and deposition practices. *Journal of Archaeological Science* 51, 135–153. https://doi.org/10.1016/j.jas.2013.03.029

Chapman, J., Videiko, M.Y., Hale, D., Gaydarska, B., Burdo, N., Rassmann, K., Mischka, C., Müller, J., Korvin-Piotrovskiy, A. and Kruts, V., 2014. The Second Phase of the Trypillia Mega-Site Methodological Revolution: A New Research Agenda. *European Journal of Archaeology* 17(3), 369–406. https://doi.org/10.1179/1461957114Y.0000000062

Diers, S., Jansen, D., Alsleben, A., Dörfler, W., Müller, J. and Mischka, D., 2014. The Western Altmark versus Flintbek – palaeoecological research on two megalithic regions. *Journal of Archaeological Science* 41, 185–198. https://doi.org/10.1016/j.jas.2013.07.036

Hinz, M. and Müller, J., 2014. The Absolute Speed of Change: Multidimensional Scaling and Innovation Rates. *Archaeometry* 57(3), 560–581. https://doi.org/10.1111/arcm.12111

Kortemeier, C., Duttmann, R. and Müller, J., 2014. Rekonstruktion der prähistorischen Siedlungs- und Landschaftsentwicklung auf Menorca (Balearen, Spanien): Untersuchungen zur Anwendbarkeit frei zugänglicher geoarchäologischer Datenquellen für die retrospektive Analyse räumlicher und zeitlicher Siedlungsdynamiken. [Dissertation, Mathematisch-Naturwissenschaftliche Fakultät].

Lee, E.J., Krause-Kyora, B., Rinne, C., Schütt, R., Harder, M., Müller, J., von Wurmb-Schwark, N. and Nebel, A., 2014. Ancient DNA insights from the Middle Neolithic in Germany. *Archaeological and Anthropological sciences* 6(2), 199–204. https://doi.org/10.1007/s12520-013-0173-0

Lee, E.J., Renneberg, R., Harder, M., Krause-Kyora, B., Rinne, C., Müller, J., Nebel, A. and von Wurmb-Schwark, N., 2014. Collective burials among agro-pastoral societies in later Neolithic Germany: Perspectives from ancient DNA. *Journal of Archaeological Science* 51, 174–180. https://doi.org/10.1016/j.jas.2012.08.037

Müller, J., 2014. Die Jungsteinzeit. *In:* S.V. Schnurbein, ed. *Atlas der Vorgeschichte: Europa von den ersten Menschen bis Christi Geburt*. korrigierte Auflage. Stuttgart: Theiss, 58–105.

Müller, J., 2014. *Exploring Landscapes: The Reconstruction of Social Space – Landschaft erforschen: Sozialen Raum rekonstruieren. In siehe: Müller 2014*, 15–29.

Müller, J., 2014. Frühe Bauern und Tellsiedlungen in Südosteuropa: Netzwerke, Bevölkerungsdichten und Siedlungssysteme. *In:* D. Gronenborn and T. Terberger, eds. *Vom Jäger und Sammler zum Bauern. Die Neolithische Revolution. Archäologie in Deutschland Sonderheft* 5. Darmstadt: Theiss, 15–24.

Müller, J., 2014. 4100–2700 B.C.: Monuments and Ideologies in the Neolithic Landscape. *In:* J.F. Osborne, ed. *Approaching Monumentality in Archaeology*. New York: State University of New York Press, 181–217.

Müller, J., 2014. Movement of plants, animals, ideas and people: Southeast-european Neolithic and Chalcolithic. *In:* C. Fowler, J. Harding and D. Hofmann, eds. *The Oxford Handbook of Neolithic Europe*. Oxford: Oxford University Press, 1–13.

Müller, J., 2014, Sozialarchäologie. *In:* D. Mölders and S. Wolfram, eds. *Schlüsselbegriffe der Prähistorischen Archäologie*, Tübinger Archäologische Taschenbücher 11. Münster: Waxmann Verlag, 267–271.

Müller, J., 2014. Weltanschauung und Wirtschaft: eine schrittweise Neolithisierung im Norden. *In:* D. Gronenborn and T. Terberger, eds. Vom Jäger und Sammler zum Bauern. Die Neolithische Revolution. *Archäologie in Deutschland Sonderheft* 5. Darmstadt: Theiss, 75–78.

Müller, J., Dibbern, H. and Hage, F., 2014. Non-megalithic mounds beneath megaliths: A new perspective on monumentality in North Central Europe. *In:* M. Furholt, M. Hinz, D. Mischka, G. Noble and D. Olausson, eds. *Landscapes, Histories and Societies in the Northern European Neolithic*, Frühe Monumentalität und soziale Differenzierung 4. Bonn: Habelt, 171–184.

Müller, J., Hofmann, R., Rassmann, K., Mischka, C., Videyko, M.Y. and Burdo, N.B., 2014. Maydanetskoe: Investigations, Based on Updated Plan (Майданецкое: исследования по обновленному плану поселения). *Stratum Plus* 2(2014), 285–302.

Müller, J. and Peterson, R., 2014. Ceramics and Society in Northern Europe. *In:* C. Fowler, J. Harding and D. Hofmann, eds. *The Oxford Handbook of Neolithic Europe*. Oxford: Oxford University Press, 573–604.

Rassmann, K., Ohlrau, R., Hofmann, R., Mischka, C., Burdo, N., Videjko, M.Y. and Müller, J., 2014. High precision Tripolye settlement plans, demographic estimations and settlement organization. *Journal of Neolithic Archaeology* 16, 96–134.

Soßna, V., Müller, J. and Unkel, I.B., 2014. *Impacts of climate variability on Pre-Hispanic settlement behavior in South Peru: the Northern Río Grande de Nasca Drainage between 1500 BCE and 1532 CE.* [Dissertation, Mathematisch-Naturwissenschaftliche Fakultät].

2013

Brozio, J.P., Dörfler, W., Feeser, I., Kirleis, W., Klooß, S. and Müller, J., 2013. A Middle Neolithic Well from Northern Germany: A Precise Source to Reconstruct Water Supply Management, Subsistence Economy, and Deposition Practices. *Journal of Archaeological Science* 51, 135–153. http://dx.doi.org/10.1016/j.jas.2013.03.029

Brozio, J.P., Kirleis, W. and Müller, J., 2013. Jungsteinzeit zwischen Haus und Freifläche – Oldenburg-Dannau LA 77. *Archäologische Nachrichten aus Schleswig-Holstein* 19, 25–27.

von Carnap-Bornheim, C., Dörfler, W., Kirleis, W., Müller, J. and Müller, U., 2013. Festschrift für Helmut Johannes Kroll: Vorwort der Herausgeber. *Offa Berichte und Mitteilungen zur Urgeschichte, Frühgeschichte und Mittelalterarchäologie* 69/70, 11.

De Cet, M., Duttmann, R., Gual, J., Gornés, S., Müller, J., Risch, R., Sintes, E. and Willié, B., 2013. Changing settlement patterns in the Mediterranean Context: A Case Study of Menorca (Balearic Islands) from Prehistory to the 19th century CE. *In:* G. Earl, T. Sly, A. Chrysanthi, P. Murrieta-Flores, C. Papadopoulos, I. Romanowska and D. Wheatley, eds. *Archaeology in the Digital Era. Papers from the 40th Annual Conference of Computer Applications and Quantitative Methods in Archaeology (CAA), Southampton, 26th–29th March 2012*. Amsterdam: Pallas Publications, 389–399.

Diers, S., Jansen, D., Alsleben, A., Dörfler, W., Müller J. and Mischka, D., 2013. The Western Altmark versus Flintbek – a palaeoecological research on two megalithic regions. *Journal of Archaeological Science* 41, 185–198.

Dreibrodt, S., Lubos, C., Hofmann, R., Müller-Scheeßel, N., Richling, I., Nelle, O., Fuchs, M., Rassmann, K., Kujundžić-Vejzagić, Z., Bork, H.R. and Müller, J., 2013. Holocene river and slope activity in the Visoko Basin, Bosnia-Herzegovina – climate and land-use effects. *Journal of Quaternary Science* 28(6), 559–570. https://doi.org/10.1002/jqs.2646

Erkul, E., Wilken, D., Rabbel, W., Yaş, T., Hofmann, R., Müller-Scheeßel, N., Rassmann, K. and Müller, J., 2013. Geoelektrische Untersuchungen auf dem spätneolithischen Siedlungshügel von Okolište. *In siehe: Müller et al. 2013*, 103–111.

Geschwinde, M. and Müller, J., 2013. Ausgehendes Neolithikum und Bronzezeit an der Ilmenau. *In:* J.P. Brozio and F. Hage, eds. *Zwei Studien zu den neolithischen und bronzezeitlichen Grabanlagen der Lüneburger Heide*, Beiträge zur Archäologie in Niedersachsen 17. Rahden/Westfalen: Verlag Marie Leidorf, 11–22.

Müller, J., 2013. 1600 B.C. – Social topographies and the development of Early Bronze Age societies in Central Europe. *In:* H. Meller, F. Bertemes, H.R. Bork and R. Risch, eds. *1600 – Kultureller Wandel im Schatten des Thera-Ausbruchs?, Tagungen des Landesmuseums für Vorgeschichte Halle 9.* Halle (Saale): Landesamt für Denkmalpflege und Archäologie Sachsen-Anhalt, 527–37.

Müller, J., 2013. Bemerkungen zur sozialen Relevanz des roten Helgoländer Flints. *In:* Niedersächsisches Institut für historische Küstenforschung, Wilhelmshaven, ed. *Marschenratskolloquium 2012: Flint von Helgoland – die Nutzung einer einzigartigen Rohstoffquelle an der Nordseeküste: 26.–28. April 2012*, Siedlungs- und Küstenforschung im südlichen Nordseegebiet 37. Rahden/Westfalen: Verlag Marie Leidorf, 189–193.

Müller, J., 2013. Demographic traces of technological innovation, social change and mobility: from 1 to 8 million Europeans (6000–2000 BCE). *In:* S. Kadrow and P. WŁodraczak, eds. *Environment and subsistence – forty years after Janusz Kruk's "Settlement studies"*, Studien zur Archäologie in Ostmitteleuropa 11. Rzeszów/Bonn: Institute of Archaeology, Rzeszów University/Habelt, 493–506.

Müller, J., 2013. I vasi campaniforme Il mosaico di una rete. *In:* R.C. de Marinis, ed. *L'età del rame. La pianura padana e le Alpi al tempo di Otzi. Catalogo della Mostra*. Brescia: Museo Diocesano, 483–502.

Müller, J., 2013. Kossinna, Childe and aDNA: Comments on the construction of identities. *Current Swedish Archaeology* 21, 35–37

Müller, J., 2013. Mesolithisch – neolithisch: Zur Entwicklung von Hütten und Häusern im südlichen Skandinavien und nördlichen Mitteleuropa. *Offa Berichte und Mitteilungen zur Urgeschichte, Frühgeschichte und Mittelalterarchäologie* 69/70 (2012/13), 249–264.

Müller, J., 2013. Missed Innovation. The Earliest Copper Daggers in Northern Central Europe and Southern Scandinavia. *In:* S. Bergerbrant and S. Sabatini, eds. *Counterpoint: Essays in Archaeology and Heritage Studies in Honour of Professor Kristian Kristiansen*, BAR International Series 2508. Oxford: BAR Publishing 443–448.

Müller, J., 2013. Vom Muschelhaufen zum Langhügel: Ertebølle und Trichterbecher – Landschaften als divergierende Raumkonzepte. *In:* S. Hansen and T. Meier, eds. Lan*dschaften als divergierende Raumkonzepte*. Berlin: De Gruyter, 133–153.

Müller, J., Bork, H.-R., Brozio, J.P., Demnick, D., Diers, S., Dibbern, H., Dörfler, W., Feeser, I., Fritsch, B., Furholt, M., Hage, F., Hinz, M., Kirleis, W., Klooß, S., Kroll, H., Lindemann, M., Lorenz, L., Mischka, D. and Rinne, C., 2013. Landscapes as Social Spaces and Ritual Meaning: Some New Results on TRB in Northern Germany. *In:* J.A. Bakker, S.B.C. Bloo and M.K. Dütting, eds. *From Funeral Monuments to Household Pottery: Current advances in Funnel Beaker Culture (TRB/TBK) research. Proceedings of the Borger Meetings 2009, The Netherlands*, BAR International Series 2474. Oxford: Archaeopress, 51–80. https://www.academia.edu/37641623/Landscapes_as_Social_Spaces_and_Ritual_Meaning_Some_New_Resu

Müller, J., Rassman, K. and Kujundzic-Vejzagic, Z., 2013. Okolište – Rekonstruktion spätneolithischer und frühchalkolithischer Siedlungsprozesse des zentralbosnischen Visokobeckens: Fragestellungen, Forschungsstrategien, Ergebnisse. *In siehe: Müller et al. 2013*, 11–68.

Müller, J., Hofmann, R., Müller-Scheeßel, N. and Rassmann, K., 2013. Neolithische Arbeitsteilung: Spezialisierung in einem Tell um 4900 v. Chr. *In:* A. Anders and G. Kulcsár, eds. *Moments in Time. Papers Presented to Pál Raczky on His 60th Birthday*, Prehistoric Studies 1. Budapest: L'Harmattan, 407–420.

Schroedter, T.M., Dreibrodt, S., Hofmann, R., Lomax, J., Müller, J. and Nelle, O., 2013. Interdisciplinary interpretation of challenging archives: Charcoal assemblages in Drina Valley alluvial and colluvial sediments (Jagnilo, Bosnia and Herzegovina). *Quaternary International* 289, 36–45. https://doi.org/10.1016/j.quaint.2012.02.030

Staude, K., Müller, J. and Müller, U., 2013. *Lineares Grubenwerk und Siedlungsplatz Triwalk, Landkreis Nordwestmecklenburg: zur Chronologie der Trichterbecherkultur in Mecklenburg-Vorpommern*. [Dissertation, Mathematisch-Naturwissenschaftliche Fakultät].

Windler, A., Thiele, R. and Müller, J., 2013. Increasing inequality in Chalcolithic Southeast Europe: The case of Durankulak. *Journal of Archaeological Science* 40(1), 204–210. https://doi.org/10.1016/j.jas.2012.08.017

2012

Feulner, F., Müller, J. and von Carnap-Bornheim, C., 2012. *Die spätmesolithischen und frühneolithischen Fundplätze im Satrupholmer Moor, Kr. Schleswig-Flensburg: Rekonstruktion einer Siedlungskammer.* [Dissertation, Philosophische Fakultät].

Fritsch, B. and Müller, J., 2012. Großsteingräber in Sachsen-Anhalt. *Beiträge zur Ur- und Frühgeschichte Mitteleuropas* 66, 1–13.

Ernée, M., Müller, J. and Rassmann, K., 2012. Ausgrabung des frühbronzezeitlichen Gräberfelds der Aunjetitzer Kultur von Prag-Miskovice. Vorläufige Auswertung und erste Ergebnisse der naturwissenschaftlichen Untersuchungen: ^{14}C-Daten und Metallanalysen. *Germania* 87 (2009), 355–410.

Hinz, M., Feeser, I., Sjögren, K.-G. and Müller, J., 2012. Demography and the intensity of cultural activities: An evaluation of Funnel Beaker Societies (4200–2800 cal BC). *Journal of Archaeological Science* 39(10), 3331–3340. https://doi.org/10.1016/j.jas.2012.05.028

Hinz, M., Furholt, M., Müller, J., Rinne, C., Raetzel-Fabian, D., Sjörgen, K.-G. and Wotzka, H.-P., 2012. RADON – Radiocarbon dates online 2012. Central European database of 14C dates for the Neolithic and the Early Bronze Age. *Journal of Neolithic Archaeology* 14. https://doi.org/10.12766/jna.2012.65

Kirleis, W., Klooß, S., Kroll, H. and Müller, J., 2012. Crop growing and gathering in the northern German Neolithic: A review supplemented by new results. *Vegetation History and Archaeobotany* 21(3), 221–242. https://doi.org/10.1007/s00334-011-0328-9

Kirleis, W., Müller, J., Kortemeier, C., Behling, H. and Soeghondo, S., 2012. The megalithic landscape of central Sulawesi: Combining archaeological and palynological investigations. *In:* M.L. Tjoa-Bonatz, A. Reinecke and D. Bonatz, eds. *Crossing Borders in Southeast Asian Archaeology: Selected papers from the 13th International Conference of the European Association of Southeast Asian Archaeologists, Berlin, 2010, Volume 1*. Singapore: NUS Press, 199–220.

Lee, E.J., Makarewicz, C., Renneberg, R., Harder, M., Krause-Kyora, B., Müller, S., Ostritz, S., Fehren-Schmitz, L., Schreiber, S., Müller, J., von Wurmb-Schwark, N. and Nebel, A., 2012. Emerging genetic patterns of the european neolithic: Perspectives from a late neolithic bell beaker burial site in Germany. *American Journal of Physical Anthropology* 148(4), 571–579. https://doi.org/10.1002/ajpa.22074

Marx, K., Rinne, C., De Cet, M., Duttmann, R. Gabler-Mieck, R., Hamer, W., Kortemeier, C. and Müller, J., 2012. Geospatial Analysis of Prehistoric Settlement Structures Considering Monumental Architecture on Mallorca. *In:* M. Furholt, M. Hinz and D. Mischka, eds. *'As time goes by'? Monumentality, Landscapes and the Temporal Perspective. Proceedings of the International Workshop "Socio-Environmental Dynamics over the Last 12,000 Years: The Creation of Landscapes II (14th –18th March 2011)" in Kiel. Volume 2*, Universitätsforschungen zur prähistorischen Archäologie 206. Bonn: Habelt, 105–112.

Müller, J., 2012. Aspenstedt-Großer Berg: Ein spätneolithisches Grab mit kupfernem Nietdolch – Hinweis auf eine "verpasste" Innovation. *Praehistorische Zeitschrift* 87(1), 44–57. https://doi.org/10.1515/pz-2012-0003

Müller, J., 2012. Changes in the Bronze Age: Social, Economical and / or Ecological Causes? *In:* J. Kneisel, W. Kirleis, M. Dal Corso, N. Taylor and V. Tiedtke, eds. *Collaps or Continuity? Environment and Development of Bronze Age Human Landscapes. Proceedings of the International Workshop "Socio-Environmental Dynamics over the Last 12,000 Years: The Creation of Landscapes II (14th –18th March 2011)" in Kiel. Volume 1*, Universitätsforschungen zur prähistorischen Archäologie 205. Bonn: Habelt, 257–265.

Müller, J., 2012. Research on Neolithic and Early Bronze Age wetland sites on the North European Plain. *In:* M.S. Midgley and J. Sanders, eds. *Lake Dwellings after Robert Munro*. Amsterdam: Sidestone Press, 47–83.

Müller, J., 2012. Tells, Fire, and Copper as Social Technologies. *In siehe: Hofmann et al. 2012*, 47–52.

Müller, J., 2012. Vom Konzept zum Ergebnis. *In siehe: Hinz and Müller 2012*, 15–25.

Müller, J., 2012. Wie entsteht Ungleichheit? *In:* T.L. Kienlin and A. Zimmermann, eds. *Beyond Elites. Alternatives to Hierarchical Systems in Modelling Social Formations*, Universitätsforschungen zur prähistorischen Archäologie 215. Bonn: Habelt, 203–211.

Müller, J., Brozio, J.P., Demnick, D., Dibbern, H. and Fritsch, B., 2012. Periodisierung der Trichterbecher-Gesellschaften: ein Arbeitsentwurf. *In siehe: Hinz and Müller 2012*, 29–33.

Müller, J. and Staude, K., 2012. Typologien, Vertikalstratigraphien und absolutchronologische Daten: Zur Chronologie des nordwestmecklenburgischen Trichterbecherfundplatzes Triwalk. *In siehe: Hinz and Müller 2012*, 35–59.

Rinne, C., Marx, K., Duttmann, R., Gabler-Mieck, R., Hamer, W.B., Kortemeier, C. and Müller, J., 2012. Geospatial analysis of prehistoric settlement structures considering monumental architecture on Mallorca. *In:* M. Furholt, M. Hinz and D. Mischka, eds. *'As time goes by'? Monumentality, Landscapes and the Temporal Perspective. Proceedings of the International Workshop "Socio-Environmental Dynamics over the Last 12,000 Years: The Creation of Landscapes II (14th –18th March 2011)" in Kiel. Volume 2*, Universitätsforschungen zur prähistorischen Archäologie 206. Bonn: Habelt, 105–112.

Rinne, C. and Müller, J., 2012. Grabenwerk und Großsteingräber in einer Grenzregion. Erste Ergebnisse des Projektes Haldensleben-Hundisburg. *In siehe: Hinz and Müller 2012*, 347–375.

2011

Arnold, V., Hartz, S., Heinrich, D., Mischka, C. and Müller, J., 2011. Menschen – Muscheln und Meer – Archäologische Untersuchungen einer spätneolithischen Siedlung bei Neukirchen-Habernis an der Flensburger Außenförde. *Archäologische Nachrichten aus Schleswig-Holstein* 17, 46–49.

Furholt, M. and Müller, J., 2011. The earliest monuments in Europe – architecture and social structures (5000–3000 cal BC). *In siehe: Furholt et al. 2011*, 15–32.

Hansen, S. and Müller, J., 2011. Einleitung in die Thematik. *In siehe: Hansen and Müller 2011*, 3–11.

Kneisel, J. and Müller, J., 2011. Produktion, Distribution, Konsumtion und die Formation sozialer Unterschiede in frühbronzezeitlichen Gesellschaften Mitteleuropas. *In siehe: Hansen and Müller 2011*, 295–324.

Müller, J., 2011. Early pottery in the North – a southern perspective. *Bericht der Römisch-Germanischen Kommission* 89, 287–300.

Müller, J., 2011. Fazit. *In siehe: Hansen and Müller 2011*, 465–467.

Müller, J., 2011. Ritual Cooperation and Ritual Collectivity: The social structure of the middle and younger Funnel Beaker North Group (3500 – 2800 BC). *In siehe: Furholt et al. 2011*, 273–284.

Müller, J., 2011. Rituelle Kooperation und Rituelle Kollektivität: Zur Sozialstruktur der mittleren und jüngeren Trichterbecher-Nordgruppe (3500–2800 v. Chr.). *In siehe: Hansen and Müller 2011*, 139–150.

Müller, J., 2011. Vom Aufräumen der Landschaft: Jungsteinzeit in Nordmitteleuropa. *Archäologie in Deutschland* 2, 4–21.

Müller, J., Hofmann, R., Müller-Scheessel, N. and Rassmann, K., 2011. Zur sozialen Organisation einer spätneolithischen Gesellschaft in Südosteuropa (5200–4400 v.Chr.). *In siehe: Hansen and Müller 2011*, 81–106.

Müller, J., 2011. How Long was an Early Bronze Age House Used? *In siehe: Hildebrandt-Radke et al. 2011*, 171–175.

2010

Czebreszuk, J. Kneisel, J. and Müller, J., 2010. Eine Bernsteinperle aus Bruszczewo. *In siehe: Müller et al. 2010*, 693–702.

Fritsch, B., Lindemann, M., Müller, J. and Rinne, C., 2010. Entstehung, Funktion und Landschaftsbezug von Großsteingräbern, Erdwerken und Siedlungen der Trichterbecherkulturen in der Region Haldensleben-Hundisburg. Vorarbeiten und erste Ergebnisse. *Archäologie in Sachsen-Anhalt, Sonderband* 13, 39–46.

Hofmann, R., Müller-Scheeßel, N., Müller, J. and Rassmann, K., 2010. Mittler zwischen den Welten – frühe Tellkultur in Zentralbosnien. *Archäologie in Deutschland* 2010, 58–61.

Kirleis, W., Müller, J., Kortemeier, C., Behling, H. and Soeghondo, S., 2010. The Megalithic Landscape of Central Sulawesi, Indonesia: Combining Archaeological and Palynological Investigations. *In:* D. Bonatz, A. Reinecke and M.L. Tjoa-Bonatz, eds. *Crossing Borders in Southeast Asian Archaeology. Selected papers from the 13th International Conference of the European Association of Southeast Asian Archaeologists*. Singapore: NUS Press, 199–220.

Kneisel, J. and Müller, J., 2010. Brusczewo – Ein bronzezeitliche Seeuferplatz. *Skyllis* 10(2), 104–111.

Müller, J. and Kneisel, J., 2010. Bruszczewo 5: Production, distribution, consumption, and the formation of social differences. *In siehe: Müller et al. 2010*, 756–782.

Müller, J., 2010. Dorfanlagen, Siedlungssysteme – Die europäische Perspektive: Südosteuropa und Mitteleuropa. *In:* C. Lichter, ed. *Aufbruch in eine neue Zeit: Europas Mitte um 4000 v. Chr. – Ausstellungskatalog.* Karlsruhe: Theiss, 250–257.

Müller, J., 2010. Ritual Cooperation and Ritual Collectivity: The Social Structure of the Middle and Younger Funnel Beaker North Group (3500–2800 BC). *Journal of Neolithic Archaeology* 12(2). https://doi.org/10.12766/jna.2010.44

Müller, J., 2010. Zur Rekonstruktion des Mehrproduktes in neolithischen Haushalten. *In:* A. Hafner, M Kinsky and I. Matuschik, eds. *Vernetzungen, Aspekte siedlungsarchäologischer Forschung. Festschrift Helmut Schlichtherle zum 60. Geburtstag.* Freiburg i.Br.: Lavori-Verlag, 51–62.

Müller, J., Brozio, J.P., Demnick, D., Dibbern, H., Fritsch, B., Furholt, M., Hage, F., Hinz, M., Lorenz, L., Mischka, D. and Rinne, C., 2010. Periodisierung der Trichterbecher-Gesellschaften. Ein Arbeitsentwurf.
Journal of Neolithic Archaeology 2010, 1–6. https://doi.org/10.12766/jna.2010.58

Müller, J. and Czebreszuk, J., 2010. Bruszczewo und Leki Male – Ein frühbronzezeitliches Machtzentrum in Großpolen. *In:* H. Meller and F. Bertemes, eds. *Der Griff nach den Sternen. Wie Europas Eliten zu Macht und Reichtum kamen – Internationales Symposium in Halle (Saale) 16.–21. Februar 2005*, Tagungen des Landesmuseum für Vorgeschichte Halle (Saale) 5. Halle (Saale): Landesamt für Denkmalpflege und Archäologie Sachsen-Anhalt. Landesmuseum für Vorgeschichte, 381–392.

Müller-Scheeßel, N., Hofmann, R., Müller, J., Rassmann, K., 2010. Entwicklung und Struktur des spätneolithischen Tells von Okolište (Bosnien-Herzegowina) unter architektursoziologischen Gesichtspunkten. *In:* P. Trebsche, N. Müller-Scheeßel and S. Reinhold, eds. *Der gebaute Raum. Bausteine einer Architektursoziologie vormoderner Gesellschaften*, Tübinger Archäologische Taschenbücher 7. Tübingen: Waxmann, 171–192.

Müller-Scheeßel, N., Hofmann, R., Müller, J. and Rassmann, K., 2010. Müllmanagement in einem spätneolithischen Tell Zentralbosniens. *Mitteilungen des Tübinger Vereins zur Förderung der Ur- und Frühgeschichtlichen Archäologie* 11, 67–79.

Müller-Scheeßel, N., Hofmann, R., Müller, J. and Rassmann, K., 2010. The Socio-Political Development of the Late Neolithic Settlement of Okolište/Bosnia-Hercegowina: Devolution by Transhumance? *In:* Kiel Graduate School "Human Development in Landscapes", ed. *Landscapes and Human Development: The Contribution of European Archaeology. Proceedings of the International Workshop "Socio-Environmental Dynamics over the last 12,000 Years: The Creation of Landscapes (1st–4th April 2009)"*, Universitätsforschungen zur prähistorischen Archäologie 191. Bonn: Habelt, 181–191.

Rinne, C., Fritsch, B., Lindemann, M. and Müller, J., 2010. Entstehung, Funktion und Landschaftsbezug von Großsteingräbern, Erdwerken und Siedlungen der Trichterbecherkulturen in der Region Haldensleben-Hundisburg: Ein Zwischenbericht nach dem ersten Jahr Feldforschung. *Jahresschrift der Museen im Landkreis Börde* 50(17), 21–39.

2009

Demnick, D., Diers, S., Fritsch, B., Müller, J. and Bork, H.-R., 2009. Bestimmend für die Raumnutzung – Großsteingräber der Altmark. *Archäologie in Deutschland* 4, 34–39.

Diers, S., Demnick, D., Fritsch, B., Müller, J., 2009. Megalithlandschaft Altmark – ein neues Projekt zu Großsteingräbern und Siedlungsmustern in der Altmark. *In:* H.-J. Beier, E. Claßen, T. Doppler, and B. Ramminger, eds. *Neolithische Monumente und neolithische Gesellschaften*, Beiträge UFG Mitteleuropa 56, Varia neolithica 6. Langenweißbach: Beier & Beran, 65–71.

Hofmann, R., Kujundzic-Vejzagic, Z., Müller, J., Rassmann, K. and Müller-Scheesel, N., 2009. Rekonstrukcija procesa naseljavanja u kasnom neolitu na prostoru centralne Bosne. *Glasnik* 50/51, 11–178.

Müller, J., 2009. Dating the Neolithic: Methodological Premises and Absolute Chronology. *Radiocarbon* 51(2), 721–736. https://doi.org/10.1017/S0033822200056058

Müller, J., 2009. Die Jungsteinzeit (6000–2000 v. Chr.). *In:* S. von Schnurbein, ed. *Atlas der Vorgeschichte. Europa von den ersten Menschen bis Christi Geburt*. Stuttgart: Theiss 60–107.

Müller, J., 2009. Kupfer, Megalithen und neue Technologien. *In:* A. Jockenhövel, ed. *WBG Weltgeschichte. Eine globale Geschichte von den Anfängen bis ins 21. Jahrhundert. Band I: Grundlagen der globalen Welt*. Darmstadt: WGB, 301–332.

Müller, J., 2009. Materielle Kultur, Territorialität und Bedeutungsinhalte von Identitäten: die Wirkung verdichteter Kommunikationsräume. *In:* D. Krausse and O. Nakoinz, eds. *Kulturraum und Territorialität: Archäologische Theorien, Methoden und Fallbeispiele. Kolloquium des DFG-SPP 1171, Esslingen 17.–18. Januar 2007.* Rahden/Westfalen: Verlag Marie Leidorf, 95–105.

Müller, J., 2009. Monumente und Gesellschaft. *Archäologische Nachrichten aus Schleswig-Holstein* 15, 30–33.

Müller, J., 2009. Neolithische Monumente und neolithische Gesellschaften. *In:* H.-J. Beier, E. Claßen, T. Doppler and B. Ramminger, eds. *Neolithische Monumente und neolithische Gesellschaften*, Beiträge UFG Mitteleuropa 56, Varia neolithica 6. Langenweißbach: Beier & Beran, 7–16.

Müller, J. and Lohrke, B., 2009. Neue absolutchronologische Daten für die süddeutsche Hügelgräberbronzezeit. *Germania* 87(1), 25–39.

Müller, J., Seregély, T., Becker, C., Christensen, A.-M., Fuchs, M., Kroll, H., Mischka, D. and Schüssler, U., 2009. A Revision of Corded Ware Settlement Pattern – New Results from the Central European Low Mountain Range. *Proceedings of the Prehistoric Society* 75, 125–142. https://doi.org/10.1017/S0079497X00000323

Müller, J. and Weinelt, M., 2009. Eine Graduiertenschule als Brücke zwischen Natur- und Kulturwissenschaften für ArchäologInnen: "Human Development in Landscapes". *Archäologische Informationen* 30, 2007 (2009), 27–28.

Müller, J. and Weinelt, M., 2009. Human Development in Landscapes. *Archäologische Nachrichten aus Schleswig-Holstein* 2009, 27–29.

Müller-Scheeßel, N., Schmitz, J., Hofmann, R., Kujundžic-Vejzagic, Z., Müller, J. and Rassmann, K., 2009. Die Toten der spätneolitihischen Tellsiedlung Okolište/Bosnien-Herzegowina: Massaker, Seuche oder Bestattungsbrauch? *In:* A. Zeeb-Lanz, ed. *Krisen – Kulturwandel – Kontinuitäten. Zum Ende der Bandkeramik in Mitteleuropa. Beiträge der internationalen Tagung in Herxheim bei Landau (Pfalz) vom 14.–17.06.2007*, Internationale Archäologie, Arbeitsgemeinschaft, Symposium, Tagung, Kongress 10. Rahden/Westfalen: Verlag Marie Leidorf, 327–340.

2008

Demnick, D., Diers, S., Bork, H.-R., Fritsch, B., Müller, J., Beyer, A., Brozio, J.-P., Erkan, E., Kroll, H. and Tafel, E., 2008. Der Großdolmen Lüdelsen 3 in der westlichen Altmark (Sachsen-Anhalt) – Baugeschichte, Rituale und Landschaftsrekonstruktion. *Journal of Neolithic Archaeology* 92. https://doi.org/10.12766/jna.2008.28

Demnick, D., Diers, S., Bork, H.-R., Fritsch, B., Müller, J., Beyer, A., Brozio, J. P., Erkul, E., Kroll, H. and Tafel, E. (2008). Das Großsteingrab Lüdelsen 3 in der westlichen Altmark (Sachsen-Anhalt) – Vorbericht zur Ausgrabung 2007 und zum Pollenprofil vom Beetzendorfer Bruch. *Jahresschrift für mitteldeutsche Vorgeschichte* 92, 232–308.

Hansen, L., Haffner, A. and Müller, J., 2008. *Die Goldfunde und Trachtbeigaben des späthallstattzeitlichen Fürstengrabes von Eberdingen-Hochdorf (Kr. Ludwigsburg).* [Dissertation, Mathematisch-Naturwissenschaftliche Fakultät].

Hofmann, R., Kujundc-Vijzagic, Z., Müller, J., Müller-Scheesel, N. and Rassmann, K., 2008. Excavations in Okolište and the reconstruction of Late Neolithic settlement processes in the Visoko Basin in Central Bosnia (5200–4500 B.C.). Weblog *Aegeo-Balkan Prehistory* [online]. https://aegeobalkanprehistory.kreas.ff.cuni.cz/2008/04/11/excavations-in-okoliste-and-the-reconstruction-of-late-neolithic-settlement-processes-in-the-visoko-basin-in-central-bosnia-5200-4500-b-c/ ; last access 12th October 2025

Jaeger, M., Czebreszuk and J. Müller, J., 2008. Pudliszki, site 5. An old hypothesis revisited. *In siehe: Czebreszuk et al. 2008*, 135–154.

Kneisel, J., Bork, H.-R., Czebreszuk, J., Dörfler, W., Grootes, P., Haas, J.N., Heußner, K.-U., Hildebrandt-Radke, I., Kroll, H., Müller, J., Wahlmüller, N. and Ważny, T., 2008. Bruszczewo – Early Bronze Defensive Settlement in Wielkopolska. Metallurgy, peat zone finds and changes in the environment. *In siehe: Czebreszuk et al. 2008*, 155–170.

Kneisel, J. Czebreszuk, J., Dörfler, W., Grootes, P., Haas, J.N., Heussner, K.-U., Karg, S., Kroll, H., Müller, J., Wahlmüller, N. and Ważny, T., 2008. Die befestigte frühbronzezeitliche Siedlung Bruszczewo: Metallproduktion, Feuchtbodenbefunde und ökologischer Kollaps? *Nachrichtenblatt Arbeitskreis Unterwasserarchäologie* 14, 51–58.

Müller, J., 2008. Siedlungs- und umweltarchäologische Modelle zum 3. Jahrtausend v. Chr. *In siehe: Dörfler and Müller 2008*, 393–399.

Müller, J. and Seregély, T., 2008. Die Schnurkeramik in den Mittelgebirgen: ein Forschungsprojekt zu endneolithischen Siedlungen in Oberfranken. *In siehe: Seregély and Müller 2008*, 9–12.

Müller, J. and Seregély, T., 2008. Die schnurkeramische Siedlungsweise in Mitteleuropa. *In siehe: Seregély and Müller 2008*, 175–184.

Müller, J. and Weinelt, M., 2008. Graduiertenschule "Human Development in Landscapes". *Archäologisches Nachrichtenblatt* 13, 342–344.

2007

Czebresuk, J. Müller, J. and Suchowska, P., 2007. Badania wykopaliskowe na stanowisku archeologicznym w Bruszczewie 5, gm. Smiegiel, pow. Koscian woj. wielkopolskie w sezonie 2005. *Wielkopolskie Sprawozdania Archeologiczne* 8(2007), 137–148.

Hofmann, R., Kujundžic-Vejzagic, Z., Müller, J., Müller-Scheessel, N. and Rassmann, K., 2007. Prospektionen und Ausgrabungen in Okolište (Bosnien-Herzegowina): Siedlungsarchäologische Studien zum zentralbosnischen Spätneolithikum (5300–4500 v. Chr.). *Bericht der Römisch-Germanischen Kommission* 87, 44–212.

Mischka, D., Dörfler, W., Grootes, P., Heinrich, D., Müller, J. and Nelle, O., 2007. Die neolithische Feuchtbodensiedlung Bad Oldesloe-Wolkenwehe LA 154: Vorbericht zu den Untersuchungen 2006. *Offa Berichte und Mitteilungen zur Urgeschichte, Frühgeschichte und Mittelalterarchäologie* 61/62, 25–63.

Müller, J., 2007. Demografiski varijabiliteti u kasnom neolitu na podrucju Bosne i pitanje gustine naseljenosti u neolitu jugoistocne Evrope. *Godisnjak* 34, 17–33.

Müller, J., 2007. Demographic variables and Neolithic ideology. *In:* M. Spataro and P. Biagi, eds. *A Short Walk through the Balkans. The First Farmers of the Carpathian Basin and Adjacent Regions: Proceedings of the Conference Held at the Institute of Archaeology UCL on June 20th–22nd, 2005*, Quaderno 12. Trieste: Società per la Preistoria e Protostoria della Regione Friuli-Venezia Giulia, 161–170.

Müller, J. and Weinelt, M., 2007. Eine Graduiertenschule als Brücke zwischen Natur- und Kulturwissenschaften für ArchäologInnen: "Human Development in Landscapes". *Archäologische Informationen* 30(2), 27–28. https://doi.org/10.11588/ai.2007.2.11357

Müller-Scheeßel, J., Hofmann, R., Kujundžic-Vejzagic, Z., Müller, J. and Rassmann, K., 2007. Die Toten der spätneolithischen Tellsiedlung von Okolište / Bosnien-Herzegowina: Massaker, Seuche oder Bestattungsbrauch? *Journal of Neolithic Archaeology* 9, 1–14. https://doi.org/10.12766/jna.2007.21

2006

Hofmann, R., Kujundžić-Vejzagić, Z., Müller, J., Müller-Scheeßel, N., Rassmann, K., Benecke, N., Bittmann, F., Dörfler, W., Ducke, B., Kučan, D., Opiola, D., Schüler, T., Schulz, W. and Wolters, S., 2006. Prospektionen und Ausgrabungen in Okolište (Bosnien-Herzegowina): Siedlungsarchäologische Studien zum Zentralbosnischen Spätneolithikum (5200–4500 v. Chr.). *Bericht der Römisch-Germanischen Kommission* 87, 44–211. https://www.researchgate.net/publication/210364170_Prospektionen_und_Ausgrabungen_in_Okoliste_Bosnien-Herzegowina ; last access 12th October 2025

Müller, J., 2006. Demographische Variablen des Bosnischen Spätneolithikums – zur Frage der Bevölkerungsrekonstruktion im südosteuropäischen Neolithikum. *In:* N. Tasic and C. Grazdanov, eds. *Homage to Milutin Garašanin*. Belgrade: Serbian Academy of Sciences and Arts, 367–378.

Müller, J., 2006. Die altmärkischen Großsteingräber im europäischen Kontext. *In:* H. Bock, B. Fritsch and L. Mittag, eds. *Großsteingräber der Altmark*. Stuttgart: Theiss, 17–45.

Müller, J., 2006. Soziale Grenzen und die Frage räumlicher Identitätsgruppen in der Prähistorie. *In:* S. Burmeister and N. Müller-Scheeßel, eds. *Soziale Gruppen – kulturelle Grenzen. Die Interpretation sozialer Grenzen in der Prähistorischen Archäologie*, Tübinger Archäologische Taschenbücher 5. Münster: Waxmann, 101–117.

2005

Czebresuk, J. and Müller, J., 2005. A Polish-German research project into a Bronze Age fortified settlement at Bruszczewo in Wielkopolska. *Archaeologia Polona* 43, 175–200.

Hartz, S., Mischka, D. and Müller, J., 2005. Die neolithische Feuchtbodensiedlung Bad Oldesloe-Wolkenwehe LA 154. Resultate der Untersuchungen 1950–1952. *Offa Berichte und Mitteilungen zur Urgeschichte, Frühgeschichte und Mittelalterarchäologie* 61/62, 7–24.

Müller, J., 2005. Bruszczewo – eine befestigte bronzezeitliche Siedlung in Großpolen. *In:* H. Barbara, J. Reinhard, K. Elke and B. Teržan, eds. *Interpretationsraum Bronzezeit: Bernhard Hänsel von seinen Schülern gewidmet*, Universitätsforschungen zur prähistorischen Archäologie 121. Bonn: Habelt, 377–388.

Müller, J., 2005. Soziale Grenzen und Zeichensysteme in prähistorischen Gesellschaften. *In:* T.L. Kienlin, ed. *Die Dinge als Zeichen: Kulturelles Wissen und materielle Kultur*, Universitätsforschungen zur prähistorischen Archäologie 127. Bonn: Habelt, 255–262.

Müller, J., 2005. Wiederbesetzung des Lehrstuhles für Urgeschichte. *Starigrad* 6, 65–67.

Müller, J., Rassmann, K. and Schüler, T., 2005. Okolište und Obre – geophysikalische Prospektionen auf neolithischen Siedlungshügeln in Zentralbosnien. *In:* W. de Bruyn, ed. *Georadar und andere zerstörungsfreie Untersuchungsmethoden von Bodendenkmälern. Internationale Fachtagung in Stovkov (Mark).* Lüneburg: Findling Buchverlag, 201–218.

2004

Czebreszuk, J. and Müller, J., 2004. Zusammenfassung und Ausblick. *In siehe: Czebreszuk and Müller 2004*, 311–303.

Ducke, B. and Müller, J., 2004. Die geomagnetische Prospektion *In siehe: Czebreszuk and Müller 2004*, 61–70.

Dürr, A., Müller, J., Riedmüller, A., Schulz, W., Seregély, T. and Tillmann, A., 2004. Die endneolithische Siedlung Voitmannsdorf, Lkr. Bamberg. Ergebnisse der Lehr- und Forschungsgrabung 2001. *Bayerische Vorgeschichtsblätter* 70, 17–56.

El-Kassem, M. and Müller, J., 2004. Predictions for Iron Age Landscapes of Bornholm (Denmark). *In siehe: Kunow and Müller 2004*, 137–142.

Kujundzic-Vejzagic, Z., Müller, J., Rassmann, K. and Schüler, T., 2004. Okolište – Grabung und Geomagnetik eines zentralbosnischen Tells aus der ersten Hälfte des 5. vorchristlichen Jahrtausends. *In:* B. Hänsel, ed. *Parerga Praehistorica: Jubiläumsschrift zur Prähistorischen Archäologie. 15 Jahre UPA*, Universitätsforschungen zur prähistorischen Archäologie 100. Bonn: Habelt, 69–81.

Kujundzic-Vejzagic, Z., Müller, J., Rassmann, K. and Schüler, T., 2004. Okolište – Iskopavanje i geofizicka prospekcija centralnobosanskog tel-naselja iz prve polovine petog milenija p.n.e. *Godišnjak* 31, 13–32.

Kunow, J. and Müller, J., 2004. Conclusion. *In: Kunow and Müller 2004*, 391–392.

Müller, J., 2004. Die östlichen Feuchtbodenareale: Stratigraphien und Architektur. *In siehe: Czebreszuk and Müller 2004*, 99–134.

Müller, J., 2004. Die Stratigraphie in Schnitt 10. *In siehe: Czebreszuk and Müller 2004*, 93–97.

Müller, J., 2004. Prestige und Status im Früh- bis Spätneolithikum nördlich der Alpen (5500–2800 v. Chr.). *In:* F. Marzatico, ed. *Guerrieri, Principi ed Eroi fra il Danubio e il Po*. Trento: Museo Castello Buonconsiglio, 101–112.

Müller, J., 2004. Prestigio e status sociale nel Neolitico a Nord delle Alpi (5500–2800 v.Chr.). *In:* F. Marzatico, ed. *Guerrieri, Principi ed Eroi fra il Danubio e il Po*. Trento: Museo Castello Buonconsiglio, 101–112.

Müller, J., 2004. Settlement Areas, Landscape Archaeology and Predictive Mapping. *In: Kunow and Müller 2004*, 27–34.

Müller, J., 2004. Typologieunabhänge Datierungen und die Rekonstruktion prähistorischer Gesellschaften. *Archäologie in Sachsen-Anhalt* 2, 21–29.

Müller, J., 2004. Zur Innovationsbereitschaft mitteleuropäischer Gesellschaften im 4. vorchristlichen Jahrtausend. *In:* M. Fansa and S. Burmeister, eds. *Rad und Wagen: Der Ursprung einer Innovation – Wagen im Vorderen Orient und Europa*. Oldenburg: Philipp von Zabern, 255–264.

Müller, J. and Czebreszuk, J., 2004. Bruszczewo – eine frühbronzezeitliche Siedlung mit Feuchtbodenerhaltung in Großpolen (2000–1700 v. Chr.). *Mitteilungen der Berliner Gesellschaft für Anthropologie, Ethnologie und Urgeschichte* 24, 91–102.

Müller, J. and Rassmann, K., 2004. Steinzeit-Tells im Blickpunkt. *Archäologie in Deutschland* 1, 60–61.

2003

Kunow, J. and Müller, J., 2003. Unentdeckten Fundplätzen auf der Spur. *Archäologie in Deutschland* 4, 8–13.

Müller, J., 2003. Ausgraben nach dem Krieg. Bamberger Archäologen in Bosnien. *Uni.vers. Das Magazin der Otto-Friedrich-Universität Bamberg* 4, 26–27.

Müller, J., 2003. Economic Continuity and political Discontinuity in Central Europe during the Third Millennium BC. *In:* J. Czebreszuk and M. Szmyt, eds. *Northeast Frontier of Bell Beakers*, BAR International Series 1155. Oxford: BAR Publishing, 3–10.

Müller, J., 2003. Kontinuitäten und Diskontinuitäten im dritten vorchristlichen Jahrtausend Mitteleuropas. *Archäologisches Korrespondenzblatt* 33(1), 39–50.

Müller, J., 2003. Zeichen eines neuen Zeitalters. *Archäologie in Deutschland* 5, 20–23.

Müller, J., 2003. Zur doppelten Hermeneutik der archäologischen Interpretation. *In:* M.K.H. Eggert, M. Heinz and U. Veit, eds. *Zwischen Erklären und Verstehen? Beiträge zu den erkenntnistheoretischen Grundlagen archäologischer Interpretation*, Tübinger Archäologische Taschenbücher 2. Münster: Waxmann, 195–199.

Müller, J., 2003. Zur räumlichen Darstellung von Radiokarbondaten. Zwei Beispiele aus dem Endneolithikum. *In:* J. Eckert, U. Eisenhauer and A. Zimmermann, eds. *Archäologische Perspektiven. Analysen und Interpretationen im Wandel: Festschrift für Jens Lüning zum 65. Geburtstag.* Rahden/Westfalen: Verlag Marie Leidorf, 71–76.

Müller, J. and Czebreszuk, J., 2003. Bruszczewo – Eine frühbronzezeitliche Siedlung mit Feuchtbodenerhaltung in Großpolen: Vorbericht zu den Ausgrabungen 1999–2001. *Germania* 81(2), 443–480.

Wilde, U., Schulz, W. and Müller, J., 2003. Ein frühhallstattzeitlicher Grabhügel bei Wettringen. *Das archäologische Jahr in Bayern* 2002(2003), 45–47.

2002

Fritsch, B., Mittag, L. and Müller, J., 2002. Scherben und Asche – Ein Friedhof der Einzelgrabkultur in Brunau. *In:* H. Bock, ed. *Hünengräber – Siedlungen – Gräberfelder. Archäologie in der Altmark – Band 1: Altsteinzeit bis Frühmittelalter*, Beiträge zur Kulturgeschichte der Altmark 1. Oschersleben: Ziethen, 78–81.

Fritsch, B. and Müller, J., 2002. Monumente der Steinzeit – Die Megalithgräber der Altmark. *In:* H. Bock, ed. *Hünengräber – Siedlungen – Gräberfelder. Archäologie in der Altmark – Band 1: Altsteinzeit bis Frühmittelalter*, Beiträge zur Kulturgeschichte der Altmark 1. Oschersleben: Ziethen, 63–73.

Furholt, M., Müller, J., Raetzel-Fabian, D., Rinne, C. and Wotzka, H.-P., 2002. *RADON – Radiokarbondaten online. Datenbank mitteleuropäischer ^{14}C-Daten für das Neolithikum und die frühe Bronzezeit*. https://www.jungsteinsite.uni-kiel.de/radon/radon.htm

Matuschik, I., Müller, J. and Schlichtherle, H., 2002. Technik, Innovationen und Witschaftswandel in der späten Jungsteinzeit. *In:* W. Meghin and D. Planck, eds. *Menschen – Zeiten – Räume. Archäologie in Deutschland: Begleitband zur Ausstellung der Landesarchäologen Berlin*. Berlin: Theiss, 73–90.

Müller, J., 2002. Endneolithisch-frühbronzezeitliche Muster sozialen Wandels? Versuch einer Zusammenfassung. *In siehe: Müller 2002*, 267–289.

Müller, J., 2002. Franken als Kommunikationsraum – von der Zeit des Gletschermannes bis zum Beginn der Bronzezeit. *In siehe: Müller et al. 2002*, 17–22.

Müller, J., 2002. Modelle zur Einführung der Zinnbronzetechnologie und zur sozialen Differenzierung der mitteleuropäischen Frühbronzezeit. *In siehe: Müller 2002*, 267–289.

Müller, J., 2002. Zur Bedeutung der Crvena stijena für das Frühneolithikum des ostadriatischen Raumes. *Godisnjak* 32, 19–21.

Müller, J., 2002. Zur Belegungsabfolge des Gräberfeldes Trebur: Argumente der typologieunabhängigen Datierung. *Praehistorische Zeitschrift* 77(2), 148–158.

2001

Kunow, J. and Müller, J., 2001. Archäoprognose im Land Brandenburg – „Die Rekonstruktion ur- und frühgeschichtlichen Siedlungsverhaltens und anthropogener Landschaftsgestaltung". *In:* M. Aufleger, D. Karg, J. Kunow, A. Mikoleietz, R. Paschke and P. Woidt, eds. *Denkmalpflege im Land Brandenburg 1990–2000: Bericht des Brandenburgischen Landesamts für Denkmalpflege und Archäologischen Landesmuseums*. Worms: Wernersche Verlagsgesellschaft, 612–613.

Müller, J., 2001. Hermeneutics and Natural Science in Prehistoric Archaeology. *In siehe: Marciniak et al. 2001*, 147–152.

Müller, J., 2001. Im Jahre 1888 v. Chr.... Bamberger Archäologen graben in Großpolen. *Uni.vers: das Magazin der Otto-Friedrich-Universität Bamberg* 1, 14–15.

Müller, J., 2001. Keramiktechnologie und typologisch-stilistische Inventargruppen – Zielsetzungen eines Methodeneinsatzes. *Bericht der Römisch-Germanischen-Kommission* 81, 2000(2001), 39–40.

Müller, J., 2001. Magdalenenberg. *In:* H. Beck, D. Geuenich, H. Steuer, eds. *Reallexikon der Germanischen Altertumskunde 19*. Berlin: De Gruyter, 120–124.

Müller, J., 2001. Neolithikum. *In:* J. Hoops, ed. *Reallexikon der Germanischen Altertumskunde 21*. Berlin: De Gruyter, 71–81.

Müller, J., 2001. Soziale Grenzen – ein Exkurs zur Frage räumlicher Identitätsgruppen in der Prähistorie. *In:* S. Kadrow, ed. *A turning of ages. Im Wandel der Zeiten: Jubilee Book Dedicated to Professor Jan Machnik on His 70th Anniversary*. Krakow: Institute of Archaeology and Ethnology, Polish Academy of Sciences, 415–427.

Müller, J., 2001. Zum Verhältnis von Schnurkeramik und jüngeren Trichterbechergruppen im Mittelelbe-Saale-Gebiet: Kontinuität oder Diskontinuität? *In:* T.H. Gohlisch and L. Reisch, eds. *Die Stellung der endneolithischen Chamer Kultur in ihrem räumlichen und zeitlichen Kontext: Erlangen 26.–28.3.1999)*, Kolloquien des Institutes für Ur- und Frühgeschichte Erlangen 1. Erlangen: Institut für Ur- und Frühgeschichte, 120–136.

Müller, J., 2001. Zusammenfassung der Projektergebnisse. *Bericht der Römisch-Germanischen-Kommission* 81, 2000 (2001) 119–126.

Müller, J. and von Willigen, S., 2001. The absolute dating of the European Bell Beaker phenomenon: consequences for the evaluation of ideological models. *In:* F. Nicolis, ed. *Bell beakers today: Pottery, People, Culture, Symbols in Prehistoric Europe – Proceedings of the International colloquium, Riva del Garda (Trento, Italy), 11–16 May 1998*. Riva del Garda: Provincia Autonoma di Trento, Servizio Beni Culturali, Ufficio Beni Archeologici, 59–80.

Müller, J., 2001. Radiokarbonchronologie – Keramiktechnologie – Osteologie – Anthropologie – Raumanalysen. Beiträge zum Neolithikum und zur Frühbronzezeit im Mittelelbe-Saale-Gebiet. *Berichte der Römisch-Germanischen-Kommission* 81, 2000 (2001) 37–128.

2000

Czebreszuk, J. and Müller, J., 2000. Müller, Johannes: Vermittler am Nordrand der Aunjetitzer Kultur. *Archäologie in Deutschland* 2, 58–59.

Müller, J., 2000. „Earplugs", ceramics and sheep: examples of communication and boundaries in the Adriatic Early Neolithic. *In:* P. Biagi, ed. *Quadreno 8. Studi sul Paleolitico, Mesolitico e Neolitico del bacino dell'Adriatico in ricordo di Antonio M. Radmilli'*. Quaderno 8. Trieste: Società Preistoria Friuli-Venezia Giulia, 151–159.

Müller, J., 2000. Mitteldeutschland im vierten und dritten vorchristlichen Jahrtausend. *Archäologie in Sachsen-Anhalt* 9, 3–15.

Müller, J., 2000. Zur Radiokarbondatierung des Jung- bis Endneolithikums und der Frühbronzezeit im Mittelelbe-Saale-Gebiet (4100–1500 v. Chr.). *Berichte der Römisch-Germanischen-Kommission* 80, 1999(2000) 31–90.

Müller, J., 2000. Zur räumlichen Darstellung von Radiokarbondaten: Zwei Beispiele aus dem Endneolithikum. *Journal of Neolithic Archaeology* 2–3, 1–20.

1999

Müller, J., 1999. Die latène- und späthallstattzeitliche Höhensiedlung der Boyneburg bei Sontra-Wichmannshausen, Kreis Eschwege. *Alt-Thüringen* 33, 125–152.

Müller, J., 1999. Soziochronologische Studien zum Jung- und Spätneolithikum im Mittelelbe-Saale-Gebiet (4100–2700 v. Chr.). *Archäologisches Nachrichtenblatt* 4, 46–55.

Müller, J., 1999. Zeiten verändern sich: Das dritte vorchristliche Jahrtausend. *Archäologie in Deutschland* 2, 20–25.

Müller, J., 1999. Zur absoluten Chronologie der mitteldeutschen Schnurkeramik. *Archäologisches Nachrichtenblatt* 4, 77–78.

Müller, J., 1999. Zur absolutchronologischen Datierung und Interpretation der mitteldeutschen Aunjetitz-Inventare. *In:* J. Bátora and P. Jaroslav, eds. *Aktuelle Probleme der Erforschung der Frühbronzezeit in Böhmen und Mähren und in der Slowakei*. Nitra: Zentrum des Archäologischen Institutes der Slowakischen Akademie, 113–126.

Müller, J., 1999. Zur Entstehung der europäischen Megalithik. *In:* K.W. Beinhauer, G. Cooney, C.E. Guksch and S. Kus, eds. *Studien zur Megalithik. Forschungsstand und ethnoarchäologische Perspektive*, Beiträge zur Ur- und Frühgeschichte Mitteleuropas 21. Mannheim/Weißbach: Beier & Beran, 51–81.

1998

Müller, J., 1998. Neue frühneolithische Fundstellen an der Ostadria. *In:* Hrvatsko Arheološko Društvo, ed. *Arheološka Istraživanja u Sibenik (Conference Sibenik 1996)*, Izdanja Hrvatskog Arheološkog Društva Svezak 19. Zagreb: Hrvatsko arheološko društvo, 63–74.

Müller, J., 1998. Zu den Strukturen der deutschen Theoriedebatte. *Archäologisches Nachrichtenblatt* 3, 219–220.

1997

Müller, J., 1997. Anthropogene Einflüsse im Uferbereich eines Soll: Bodenverlagerungen als Indikatoren lokaler Landnahmen. *Archäologische Berichte aus Mecklenburg-Vorpommern* 4, 22–29.

Müller, J., 1997. Ganggräber. *In:* H. Beck, H. Steuer, D. Timpe, eds. *Hoops Reallexikon der Germanischen Altertumskunde 10*. Berlin New York: De Gruyter, 426–429.

Müller, J., 1997. Hinweise auf Arbeitsteilung im bernburgischen Erdwerk Halle-Dölauer Heide. Festschrift Institut Halle. *In:* K.-D. Jäger, ed. *Alteuropäische Forschungen*. Neue Folge 1. Weißbach: Beier & Beran, 33–36.

Müller, J., 1997. Neolithische und chalkolithische Spondylus-Artefakte. Anmerkungen zu Verbreitung, Tauschgebiet und sozialer Funktion. *In:* C. Becker, M.L. Dunkelmann, C. Metzner-Nebelsick, H. Peter-Röcher, M. Roeder and B. Terzan, eds. *Chronos. Beiträge zur prähistorischen Archäologie zwischen Nord- und Südosteuropa. Festschrift für Bernhard Hänsel*, Internationale Archäologie – Studia honoraria 1. Espelkamp: Verlag Marie Leidorf, 91–106.

Müller, J., 1997. Zur absolutchronologischen Datierung der europäischen Megalithik. *In siehe: Fritsch et al. 1997*, 63–105.

Müller, J., 1997. Zur Struktur archäologischer Daten und der Anwendung multivariater Verfahren. *In siehe: Müller and Zimmermann 1997*, 3–7.

1996

Müller, J., 1996. The use of correspondence analysis for different kinds of data categories:Domestic and ritual Globular Amphorae sites in Central Germany. *In:* H. Kamermans and K. Fennema, eds. *Interfacing the Past. Computer Applications and Quantitative Methods in Arch. CAA95*, Analecta Praehistorica Leidensia 28. Leiden: Sidestone Press, 217–222.

Müller, J., 1996. Die Ausgrabungen auf der Boyneburg 1995. *Das Werraland* 48, 12 ff.

Müller, J., 1996. "Interfacing the Past" – CAA 1995 in Leiden, Holland. *Archäologisches Nachrichtenblatt* 1, 102–103.

Müller, J., 1996. Konsequenz: Die Beschreibung von Hierarchien wenig strukturierter prähistorischer Gesellschaften. *In siehe: Müller and Bernbeck 1996*, 115–117. https://doi.org/10.11588/propylaeum.1

Müller, J. Herrera and J. Knossalla, N., 1996. Spondylus und Dechsel – zwei gegensätzliche Hinweise auf Prestige in der mitteleuropäischen Linearbandkeramik? *In siehe: Müller and Bernbeck 1996*, 81–96. https://doi.org/10.11588/propylaeum.1

Müller, J. and Sommer, U., 1996. Prestige – Prestigegüter – Sozialstrukturen. Tagung der AG Theorie in Oldenburg am 19.10.1995. *Ethnographisch-Archäologische Zeitschrift* 36, 1995 (1996), 343–350.

1995

Müller, J., 1995. Die Ausgrabungen auf der Boyneburg 1994. *Das Werraland* 47, 13–14.

1994

Müller, J., 1994. Altersorganisation und Westhallstatt: ein Versuch. *Ethnographisch-Archäologische Zeitschrift* 35, 220–240.

Müller, J., 1994. Bestattungsformen als Spiegel dualer Organisation in prähistorischen Gesellschaften? *Mitteilungen der Berliner Gesellschaft für Anthropologie, Ethnologie und Urgeschichte* 15, 81–88.

Müller, J., 1994. Die Ausgrabungen auf der Boyneburg 1993. Das Werraland, 46, 13–14.

Müller, J., 1994. Zur sozialen Gliederung der Nachbestattungsgemeinschaft vom Magdalenenberg bei Villingen. *Praehistorische Zeitschrift* 69, 175–221.

1993

Müller; J., 1993. Modelle zur Neolithisierung aus mediterraner Sicht. *Archäologische Informationen* 16, 32–38.

1992

May, T., Schuhmacher, T., Müller, J. and Kunst, M., 1992. Zur Frage anthropogener Einwirkungen auf die Vegetation im Rahmen der Neolithisierung des Mittelmeerraumes. Beispiele aus Ost-Spanien und Dalmatien. *Die Erde* 123, 29–47.

1991

Müller, J., 1991. Das ostadriatische Frühneolithikum: Die Impresso-Kultur und die Neolithisierung des Adriaraumes (Kurzzusammenfassung). *Archäologische Informationen* 13(2), 232–235.

Müller, J., 1991. Die ostadriatische Impresso-Kultur: Zeitliche Gliederung und kulturelle Einbindung. *Germania* 69, 311–358.

Müller, J., 1991. Fürsten oder Häuptlinge: Experimente mit Hallstatthügeln. *In:* M. Fansa, ed. *Experimentelle Archäologie: Bilanz 1991*, Archäologische Mitteilungen aus Nordwestdeutschland Beiheft 6. Oldenburg: Isensee, 215–225.

1990

Chapman, J. and Müller, J., 1990. Early farmers in the Mediterranean Basin: The Dalmatian evidence. *Antiquity* 64(242), 127–134. https://doi.org/10.1017/S0003598X00077371

Karg, S. and Müller, J., 1990. Neolithische Getreidefunde aus Pokrovnik, Dalmatien. *Archäologisches Korrespondenzblatt* 20(4), 373–386.

Müller, J., 1990. Arbeitsleistungsberechnung für das Großsteingrab Kleinenkneten 1. *In:* M. Fansa, ed. *Experimentelle Archäologie in Deutschland. Begleitschrift zu einer Ausstellung des Staatlichen Museums für Naturkunde und Vorgeschichte Oldenburg*, Archäologische Mitteilungen aus Nordwestdeutschland Beiheft 4. Oldenburg: Isensee, 210–219.

Müller, J., 1990. Arbeitsleistung und gesellschaftliche Leistung bei Megalithgräbern: Das Fallbeispiel Orkney. Eine EDV-gestützte Auswertung. *Acta Praehistorica et Archaeologica* 22, 9–35.

Müller, J., 1990. Cultural definition and interaction of the eastern Adriatic early neolithic. *Berytus* 36, 1988(1990), 101–125.

1988

Müller, J., 1988. Škarin Samograd – Eine frühneolithische Station mit monochromer Ware und Impresso-Keramik an der Ostadria. *Archäologisches Korrespondenzblatt* 18, 219–235.

1987

Müller, J., 1987. Ein Vergleich von Radiokarbon-Daten nord- und westeuropäischer Megalithgräber. *Archäologisches Korrespondenzblatt* 17, 71–75.

1986

Müller, J., 1986. Aufnahme und Auswertung geographischer Daten am Beispiel nordschottischer Megalithgräber. *Archäologische Informationen* 9(1), 42–48.

Müller, J., 1986. The chambered cairns of the Northern and Western Isles. *Archäologische Informationen* 9(2), 157–160.

1974

Müller, J., 1974. Kulturelle und historische Betrachtung der Becherkultur. *Querschnitt* 22/23, 13.

Müller, J., 1974. Eine Beobachtung an den Hügelgräbern im Wettesinger Gemeindewald in Bezug auf die Gesellschaftsstruktur. *Querschnitt* 27, 7.

1972

Müller, J., 1972. Das Steinkistengrab von Züschen. *Allgemeine Zeitung des jugendlichen Archäologie Verbandes* 10.

Müller, J., 1972. Die Indus Kultur. *Allgemeine Zeitung des jugendlichen Archäologie Verbandes* 4.

Müller, J., 1972. Die Burgen des Wolfhagener Landes. Heimatgeschichte zwischen Diemel- und Edertal. *Allgemeine Zeitung des jugendlichen Archäologie Verbandes* 6–7.

1971

Müller, J., 1971. Vom Urmensch zum Homo Sapiens. Die Geschichte Der Gemeinde Breuna. Neue Forschungen des J.A.V. *Allgemeine Zeitung des jugendlichen Archäologie Verbandes* 4–5.

BOOK REVIEWS

2003

Müller, J., 2003. Buchbesprechung: U. Dirks, Die Bernburger Kultur in Niedersachsen (Rahden 2000). *Germania* 81, 300–302.

2001

Müller, J., 2001. Buchbesprechung: H. Schubert, Die bemalte Keramik des Frühneolithikums in Südosteuropa, Italien und Westanatolien (Rahden 1999). *Praehistorische Zeitschrift* 76, 222–223.

Müller, J., 2001. M.K.H. Eggert, Prähistorische Archäologie: Konzepte und Methoden (Stuttgart 2000). http://www.archaeologie-online.de/bibliothek/rezensionen/eggert.php

1999

Müller, J., 1999. Buchbesprechung: R. Bernbeck, Theorien in der Archäologie (Tübingen/Basel 1997). M.K.H. Eggert and U. Veit (Hrsg.), Theorien in der Archäologie: Zur englischsprachigen Diskussion (Münster/New York/München/Berlin 1998). *Germania* 77, 862–865.

1998

Müller, J., 1998. Buchbesprechung: J. Schibler, H. Hüstermann-Plogmann, S. Jacomet, Chr. Brombacher, E. Gross-Klee and A. Rast-Eicher, Ökonomie und Ökologie neolithischer und bronzezeitlicher Ufersiedlungen am Zürichsee (Zürich und Egg 1997). *Fundberichte Baden-Württemberg* 22, 855–856.

Müller, J., 1998. Buchbesprechung: J. Lüning and P. Stehli, eds. Die Bandkeramik im Merzbachtal auf der Aldenhovener Platte, Rheinische Ausgrabungen 36, Beiträge zur neolithischen Besiedlung der Aldenhovener Platte V. *Praehistorische Zeitschrift* 73, 253–256.

1996

Müller, J., 1996. Buchbesprechung: L.E. Talalay, Deities, Dolls, and Devices. Neolithic Figurines from Franchthi Cave, Greece. *Praehistorische Zeitschrift* 71, 249–251.

Müller, J., 1996. Buchbesprechung: J. Troeng, Worldwide Chronology of Fifty-three Prehistoric Innovations. *Praehistorische Zeitschrift* 71, 96–97.

Müller, J., 1996. Buchbesprechung: Robert W. Ehrich ed., Chronologies in Old World Archaeology. *Praehistorische Zeitschrift* 71(1), 95–96.

Müller, J., 1996. Buchbesprechung: Vitelli, Keramik Franchthi. *Praehistorische Zeitschrift* 70, 249–251.

1995

Müller, J., 1995. Buchbesprechung: A. Guidi and M. Piperno, Italia preistorica. *Germania* 73, 273–276.

1993

Müller, J., 1993. Buchbesprechung: J.-P. Mohen, Megalithkultur in Europa. Acta Praehistorica et Archaeologica 23, 1992(1993), 369–372.

List of Habilitations, Dissertations, and Master's Theses Supervised by Johannes Müller / Verzeichnis der von Johannes Müller betreuten Habilitationen, Dissertationen und Magisterarbeiten

HABILITATIONS

2014

Furholt, Martin (Kiel)
Das ägäische Neolithikum und Chalkolithikum –
Transformationen sozialer Handlungsmuster in Anatolien und Griechenland zwischen 6500 und 4000 v. Chr.

2012

Mischka, Doris (Kiel)
Das Neolithikum in Flintbek, Kr. Rendsburg-Eckernförde, Schleswig-Holstein.
Eine feinchronologische Studie zur Besiedlungsgeschichte einer Siedlungskammer anhand von Gräbern

2010/2011

Nakoinz, Oliver (Kiel)
Archäologische Kulturgeographie der ältereisenzeitlichen Zentralorte Südwestdeutschlands

2005

Schuhmacher, Thomas X. (Bamberg)
Kontakte, Handel und Schifffahrt im westlichen und zentralen Mittelmeerraum.
Die Rolle der Iberischen Halbinsel am Beginn der Bronzezeit

DISSERTATIONS

2025

Anja Behrens (Kiel)
Megalithik auf Rügen.
Eine Studie zur Monumentalität und sozialen Differenzierung anhand trichterbecherzeitlicher Bestattungen

2024

Bilotti, Giacomo (Kiel)
Population dynamics and land-use patterns in the southwestern Baltic region during the Neolithic and the Bronze Age

Sabnis, Shikharani (Kiel)
Natural Resources Utilisation and Settlement Pattern in Hilly District of Assam (West Karbi Anglong and Dima Hasao).
An ethnoarchaeological Study

Wilkes, Fynn (Kiel)
The development of social inequality in the Carpathian Basin between 5200 and 1000 BCE.
A quantitative study on Neolithic, Copper Age and Bronze Age cemeteries and methodological considerations

2023

Brinkmann, Johanna (Kiel)
Gesellschaft und Monumentalität zwischen Nordatlantik und Ostsee 4500–1800 v. Chr.

Serbe, Benjamin (Kiel)
Bernstein in der Bronzezeit. Netzwerke und Interaktion in Europa

2022

Hölscher, David (Kiel)
Wissenstransfer in der Archäologie.
Eine Studie zur Vermittlung aktueller Forschungsinhalte mit multimedialen Lernumgebungen

2021

Schultrich, Sebastian (Kiel)
Kriegerideal und Netzwerke:
Die Doppeläxte West- und Mitteleuropas im Kontext der jung- bis endneolithischen Kulturentwicklung

2020

Schaefer-Di Maida, Stefanie (Kiel)
Bronzezeitliche Transformationsprozesse in Schleswig-Holstein am Beispiel vom Fundplatz von Mang de Bargen, Bornhöved (Kr. Segeberg)

Shatilo, Liudmyla (Kiel)
Tripolye typo-chronology: mega and smaller sites in the Sinyukha river basin

Tiedtke, Verena (Kiel)
Grab und Raum.
Ressourcenteilung in der Rituallandschaft um den Bestattungsplatz Müllrose Fundplatz 2 (Brandenburg)

2019

Ohlrau, René (Kiel)
Maidanets'ke. Development and decline of a Trypillian mega-site in Central Ukraine

Staniuk, Robert (Kiel)
Tradition and Practice. Study on Pottery, Chronology and Social Dynamic of the Hungarian Bronze Age

2018

Di Maida, Gianpiero (Kiel)
Marks on the rocks. Rock and mobile art as expression of the hunter-gatherers' groups Weltanschauung in the Sicilian landscape from Lateglacial to Early Holocene

Fuchs, Katharina (Kiel)
Interdisciplinary analysis of the cemetery "Kudachurt 14". Evaluating indicators of social inequality, oral health and diet during the Bronze Age key period between 2200–1650 BCE in the Northern Caucasus

Jürgens, Fritz (Kiel)
Der bandkeramische Zentralort von Borgentreich-Großeneder (Kr. Höxter)

Kleijne, Jos (Kiel)
Embracing Bell Beaker.
Adopting new ideas and objects across Europe during the later 3rd millennium BC (c. 2600–2000 BC)

Torfing, Tobias (Kiel)
Northern Networks. An analysis of three Neolithic Enclosures from the Jutland peninsular

Wollentz, Gustav (Kiel)
Landscapes of Painful Pasts: Examining the Temporalities of Difficult Heritage

Wunderlich, Maria (Kiel)
Megalithische Monumente und Sozialstrukturen:
Vergleichende Studien zu rezenten und trichterbecherzeitlichen Gesellschaften

2017

Gelabert Oliver, Maria (Kiel)
Landscape distribution of talaiotic monuments as markers of social space

Menne, Julia (Kiel)
Keramik aus Megalithgräbern in Nordwestdeutschland. Interaktionen und Netzwerke der Trichterbecherwestgruppe

2016

Gorbahn, Hermann Georg (Kiel)
Pernil Alto. An agricultural village of the Middle Archaic Period in Southern Peru

Mennenga, Moritz (Kiel)
Zwischen Elbe und Ems. Die Siedlungen der Trichterbecherkultur in Nordwestdeutschland

Ribeiro, Artur (Kiel)
Archaeology and the Historical Understanding

2015

Bergemann, Stefanie (Kiel)
Landschaft im Wandel der Zeit –
Der Fundort Zauschwitz im Lkr. Leipziger Land und die Siedlungsdynamik Mitteldeutschlands

Brozio, Jan Piet (Kiel)
Megalithanlagen und Siedlungsmuster im trichterbecherzeitlichen Ostholstein

Dibbern, Hauke (Kiel)
Das trichterbecherzeitliche Westholstein: Eine Studie zur neolithischen Entwicklung von Landschaft und Gesellschaft

Großmann, Ralph (Kiel)
Das dialektische Verhältnis von Schnurkeramik und Glockenbecher zwischen Rhein und Saale

Hage, Franziska (Kiel)
Büdelsdorf / Borgstedt: eine trichterbecherzeitliche Kleinregion

Iwe, Karina (Kiel)
A study of the animal style of Scythian nomadic horse-riders in Central Asia

Lorenz, Luise (Kiel)
Kommunikationsräume neolithischer Gesellschaften in der nordmitteleuropäischen Tiefebene

Schmütz, Kay (Kiel)
Die Entwicklung zweier Konzepte? Großsteingräber und Grabenwerke bei Haldensleben Hundisburg

2014

De Cet, Monica (Kiel)
Long-Term Social Development on a Mediterranean Island: Menora between 1600 BC and 1900 CE

Diers, Sarah (Kiel)
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Vegetationskundliche Untersuchungen an Mooren und trichterbecherzeitlichen Fundplätzen der Altmark

Saev, Ilja (Kiel)
Gefäßkeramik - Funktion, Form, Habitus

Soßna, Volker (Kiel)
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2013

Ducke, Benjamin (Kiel)
Archäoinformatik – Verarbeitung und Analyse vierdimensionaler Daten in der Archäologie

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Älter- und mittelbronzezeitliche Bestattungen zwischen Nordischem Kreis und süddeutscher Hügelgräberkultur. Gesellschaftsstrukturen und kulturhistorische Beziehungen

Ricci, Andrea (Kiel)
An archaeological landscape study of the Birecik-Carchemish Region (Middle Euphrates River Valley) During the 5th, 4th and 3rd Millennium BC

Schulz Paulsson, Bettina (Kiel)
Time and Stone: The Emergence and Development of Megaliths and Megalithic Societies in the Neolithic and the Copper Age in Europe

Taylor, Nicole (Kiel)
Burning Questions. Identity and Late Bronze Age/Early Iron Age Cremation Cemeteries

2012

Golowin, Eugen (Kiel)
Neolithische und chalkolithische Siedlungsweise in Südosteuropa (6700–3000 v. Chr.)

Mahlstedt [Rathje], Sveja (Kiel)
Das Mesolithikum im westlichen Niedersachsen. Untersuchungen zur materiellen Kultur und zur Landschaftsnutzung

2011

Glykou, Aikaterini (Kiel)
Neustadt LA 156.
Ein submariner Fundplatz des späten Mesolithikums und des frühesten Neolithikums in Schleswig-Holstein.
Untersuchungen zur Subsistenzstrategie der letzten Jäger, Sammler und Fischer an der norddeutschen Ostseeküste

Hinz, Martin (Kiel)
Neolithische Siedlungsstrukturen im südöstlichen Schleswig-Holstein. Dynamik in Landschaft und Besiedlung

Hofmann, Robert (Kiel)
Okolište – Spätneolithische Keramik und Siedlungsentwicklung in Zentralbosnien

Moetz, Fevzi-Kemal (Kiel)
Sesshaftwerdung. Aspekte der Niederlassung im Neolithikum in Obermesopotamien

Staude Katrin (Kiel)
Lineares Grubenwerk und Siedlungsplatz Triwalk, Landkreis Nordwest-Mecklenburg.
Zur Chronologie der Trichterbecherkultur in Mecklenburg-Vorpommern

Steffen, Christoph (Kiel)
Gesellschaftswandel während der älteren Eisenzeit –
Soziale Strukturen der Hallstatt- und Frühlatènezeit in Baden-Württemberg

2010

Klooß [Labes], Stefanie (Kiel)
Holzartefakte von endmesolithischen und frühneolithischen Küstensiedlungen an der südwestlichen Ostseeküste

Schneider, Rouven B. (Kiel)
Kommunikation und Interaktion –
Kontakt- und Einflusssphären während der Jüngeren Bronzezeit und Älteren Eisenzeit Europas

2009

Dürr, Janina (Kiel)
Von Tierhütern und Tiertötern. Mythos und Ethik der Jagd im kulturhistorischen Vergleich

Feulner, Frederick (Kiel)
Die spätmesolithischen und frühneolithischen Fundplätze im Satrupholmer Moor, Kr. Schleswig-Flensburg.
Rekonstruktion einer Siedlungskammer

2008

Seregély, Timo (Bamberg)
Wattendorf-Motzenstein: eine schnurkeramische Siedlung auf der Nördlichen Frankenalb. Studien zum dritten vorchristlichen Jahrtausend in Nordostbayern

Steffens, Jan (Kiel)
Die neolithischen Fundplätze von Rastorf, Kreis Plön.
Eine Fallstudie zur Trichterbecherkultur im nördlichen Mitteleuropa am Beispiel eines Siedlungsraumes

2006

Furholt, Martin (Kiel)
Die nördlichen Badener Keramikstile im Kontext des mitteleuropäischen Spätneolithikums (3650–2900 v. Chr.)

2005

Honig, Peter (Kiel)
Studien zur bronzezeitlichen Keramikentwicklung am Beispiel der Siedlungskeramik der Windsheimer Bucht und des süddeutschen Donauraumes

Grietje Suhr (Berlin)
Chance oder Bedrohung? Theoretische Ansätze in der archäologischen Forschung Osteuropas

Ullrich, Markus (Bamberg)
Das Dolinenfeld „Am Hahnenbuck" bei Ergersheim, Lkr. Neustadt a. d. Aisch-Bad-Windsheim.
Ein Fundplatz des Endneolithikums, der Bronze- und der Urnenfelderzeit.
Mit einer Untersuchung zur Chronologie von Schnurkeramik und Glockenbechern an Rhein, Main und Neckar

2003

Münch, Ulla (Bamberg)
Überlegungen zur Quellenkritik als eingrenzender Faktor der Archäoprognose

MASTER'S THESES / MASTER-, MAGISTER- UND DIPLOMARBEITEN BIS 2017

2017

Brandtstätter, Lennart (Kiel)
Tripolje-Keramik aus Maidanetske (Ukraine): Auswertungen der Grabungskampagne 2013

Breske, Boris (Kiel)
Untersuchungen zu neolithischen Beilen in Schleswig-Holstein

Kaczmarek, Jan (Kiel)
Oldenburg-Dannau LA 191. Die Auswertung der Funde und Befunde aus Fläche A

Schultrich, Sebastian (Kiel)
Das Jungneolithikum in Schleswig-Holstein

Skorna, Henry (Kiel)
Der Hortfund von Neuenkirchen, Landkreis Mecklenburg-Strelitz –
Studien zu einer neolithischen Deponierung von Kupferobjekten

2016/2017

Brinkmann, Johanna (Kiel)
Arbeitsaufwandsberechnungen zu Bronzeartefakten.
Diachroner Vergleich von Aufwand und Wert in Mitteleuropa

Kobs (Hiller), Annika (Kiel)
Menhire: Eine strukturelle Analyse

2015/2016

Bock, Annalena (Kiel)
Tastrup LA 29. Ein trichterbecherzeitlicher Brunnenbefund

Raese, Hendrik (Kiel)
Chronologische, technologische und typologische Aspekte bronzezeitlicher Keramik aus Bruszczewo

2015

Brühl, Carina (Kiel)
Die Tüllengeweihäxte des südwestlichen Ostseeraums

Jürgens, Fritz (Kiel)
Das vierte vorchristliche Jahrtausend in Ostwestfalen

Ohlrau, René (Kiel)
Tripolje Großsiedlungen. Geomagnetische Prospektion und architektursoziologische Perspektiven

Spies, Benjamin (Kiel)
Das Mesolithikum im Landkreis Main-Spessart

2014/2015

Autenrieth, Sabrina (Kiel)
Die spätneolithische Siedlung Borđoš, Vojvodina: Interregionale Beziehungen und interne Differenzierung

Laabs, Julian (Kiel)
Das Gräberfeld von Dunaújváros-Duna-dűlő und die Mittlere Bronzezeit im zentralen Karpatenbecken:

Ortmann, Dominique (Kiel)
Trichterbecherzeitliche Keramik im megalithischen und nichtmegalithischen Grabkontext:
Beispiele aus dem Elbe-Weser-Dreieck

Vasiliades, Stefan (Kiel)
Wangels LA 505: Studien zur neolithischen Beilproduktion

2013/2014

Bornschein, Janina (Kiel)
Studien zu mitteldeutschen, böhmischen und mährischen Kindergräbern der Kugelamphoren-, Schnurkeramik- und Glockenbecher-Gesellschaft

Höfgen, Wencke (Kiel)
Die Muschelhaufen von Quern-Neukirchen LA 28.
Spätneolithisches Siedlungs- und Subsistenzverhalten in Schleswig-Holstein

Wunderlich, Maria (Kiel)
Der Denghoog LA 85 bei Wenningstedt auf Sylt im Kontext der trichterbecherzeitlichen Gesellschaft auf den Nordfriesischen Inseln

2013

Herrmann, Sabrina (Kiel)
Die vierfache Kreisgrabenanlage von Kyhna (Nordsachsen) –
Untersuchungen der Verfüllungsprozesse an den Hauptgräben

Tiede, Heiko (Kiel)
Die Beile der mitteldeutschen Schnurkeramik. Eine typologisch-chronologische Analyse

Gundelach, Marthe (Kiel)
Die Mahlsteine aus der spätneolithischen Siedlung Okolište (Bosnien-Herzegowina):
Von der Klassifikation zur sozialarchäologischen Aussage

Matheis, Magdalena (Kiel)
Prähistorische Spondylusnutzung in der Alten und Neuen Welt – Ein Vergleich

Naumann, Manfred (Kiel)
Studie der Brandgrabsitten Norddeutschlands im Endneolithikum

Reimann, Kirsten (Kiel)
Die Keramik von Lavenstedt FSTNr. 178, 2009

2012/2013

Fuhrmann, Ulrike (Kiel)
Die Chronologie der Glockenbecher im Mittelelbe-Saale-Gebiet

Wetzel, Richard (Kiel)
Die früh- bis mittelneolithische Grube von Nauen 26

2012

Gehrke, Florian (Kiel)
Die minoische Gesellschaft: friedlich oder kriegerisch?

Haberkern, Eva (Kiel)
Kulturgeschichte der Osterinsel – Archäologische Untersuchungen in der Quebrada Vaipu

Köhpcke, Petra (Kiel)
Die Neolithisierung in der Waldzone Finnlands

2011/2012

Grünewald, Tim (Kiel)
Zur Funktion neolithischer Grabenwerke in Mitteleuropa

Latza, René (Kiel)
Das trichterbecherzeitliche Haus von Wittenwater

2011

Fehr [Schmütz], Ina-Isabelle (Kiel)
Der Fundplatz Grube-Rosenfelde LA 83, Kreis Oldenburg, Schleswig-Holstein.
Untersuchungen zur Siedlungsweise des akeramischen Ertebølle

Groffmann, Kim A. (Kiel)
Unterschiede zwischen den Geschlechterrollen im Neolithikum

Loosch, Michael (Kiel)
Eine eisenzeitliche Siedlung bei Gardelegen

2010/2011

Auber, Stefan (Kiel)
Donje Moštre – Ein äneolithischer Fundplatz in Bosnien und Herzegowina und seine kulturelle Einhängung

Bleckmann, Johanna (Kiel)
Die Baalberger Gräber in Sachsen-Anhalt

Bultmann, Ulrich (Kiel)
Landschaft, Tiere, Analysen.
Tierknochenanalysen und Landschaftsnutzung butmirzeitlicher Fundplätze im Visokobecken (BiH)

Golowin, Eugen
Siedlungsweise im Neolithikum und Chalkolithikum in Südosteuropa

Harten, Lorenz (Kiel)
Die neolithische Keramik der Feuchtbodensiedlung Bad Oldesloe-Wolkenwehe

Mennenga, Moritz (Kiel)
Archäoprognose in Schleswig-Holstein

Nimke, Karin (Kiel)
Figurinen in Südosteuropa

Schmütz, Kay (Kiel)
Das Ende des mitteleuropäischen Spätneolithikums.
Regionalität und Überregionalität als kulturhistorisches Phänomen

Windler, Arne (Kiel)
Die neue ökonomische Geographie in der archäologischen Theorie

2010

Behrens, Anja (Kiel)
Fidvár bei Vráble. Untersuchungen zu der Befestigung A

Saev, Ilja (Kiel)
Die Grenze zwischen der Kugelamphoren-West- und Ostgruppe

Schroeter, Johannes (Kiel)
Untersuchung der Befestigungsanlage in Rybník in der Slowakei

2009/2010

Fuchs, Katharina (Kiel)
Der schnurkeramische Bestattungskomplex von Remstädt, Kr. Gotha.
Archäologie, Anthropologie und kleinregionaler Kontext im südwestlichen Thüringer Becken

Müller, Stephanie (Kiel)
Kromsdorf-Nord: Anthropologisch-archäologische Studien zum Endneolithikum im Ilm- Saale-Gebiet

2009

Brozio, Jan Piet (Kiel)
Bestattungen der Einzelgrabkultur an der Ilmenau (Nordostniedersachsen)

Hage, Franziska (Kiel)
Das bronzezeitliche Hügelgräberfeld bei Wittenwater, Lkr. Uelzen

Lorenz, Luise (Kiel)
Typologisch-chronologische Studien zu Deponierungen der nordwestlichen Aunjetitzer Kultur

Norden [Feierabend], Binnie (Kiel)
Hammelev – Eine Studie zu rituellen Gruben der Einzelgrabkultur

Schafferer, Georg (Bamberg)
Untersuchungen zur Verbreitung und Bedeutung von Bernstein während der Frühbronzezeit zwischen der Ostsee und dem Karpatenbecken

Schroedter, Tim M. (Kiel)
Holz und Holzbearbeitung in der neolithischen Siedlung Okolište, Bosnien-Herzegowina

2008/2009

Guldin, Annette (Kiel)
Studien zur chronologischen und räumlichen Gliederung der Schönfelder Gruppen

Vrcić, Anita (Kiel)
Öffentlichkeitsarbeit in der Archäologie am Beispiel des Helms-Museums in Hamburg- Harburg

2008

Goldhammer, Julia (Kiel)
Untersuchungen zur Stratigraphie, Fundverteilung und zum Fundspektrum der mittleren Ertebøllekultur in Ostholstein. Die Nachgrabungen in Grube-Rosenhof aus den Jahren 2001 und 2002

Pedersen, Hilthard (Kiel)
Sozialarchäologische Analysen zur Kontinuität des neolithischen Bestattungsrituals Südskandinaviens – Versuch einer Analyse von Bernstein und Nachnutzungen

Rassmann, Constanze (Kiel)
Nichtmegalithische Langhügel und neolithische Kontakte im Nordseeraum

2007/2008

Dibbern, Hauke (Kiel)
Ein Siedlungsareal im Feuchtbodenbereich der bronzezeitlichen Siedlung Bruszczewo

Hinz, Martin (Kiel)
Eine multivariate Analyse Aunjetitzer Fundkomplexe

Kamp, Klaas (Kiel)
Die linearbandkeramische Fundstelle Westerhausen

Krause-Kyora, Ben (Kiel)
Ein Trümmerhaufen: Lithische Aspekte aus der neolithischen Siedlung Hemmingstedt LA 2

Mackowiak, Eva (Kiel)
Bernstein im Endneolithikum Europas: Verbreitung und Bedeutung in KAK, SK und GBK

2006/2007

Demnick, Denis (Kiel)
Sichtbarkeitsanalysen am Beispiel altmärkischer Megalithgräber

Diers, Sarah (Kiel)
Palynologische und archäologische Untersuchungen am Fundplatz Bruszczewo 5

Dürr, Alexa (Bamberg)
Studien zu Modellen neolithischer Sozialstrukturen

2005

Opiola, Dagmar (Bamberg)
Pilotstudie zum Nachweis von Oberflächengestaltung im neolithischen Hausbau.
Untersuchungen an archäologischen Funden aus dem Teil Okolište

Söhn, Thomas (Bamberg)
Die Keramik der spätneolithischen Tellsiedlung Okolište (Bosnien-Herzegowina)

2004

Fries, Felicitas (Bamberg)
Neolithische Häuser im Vergleich

Kreibig, Wiebke (Bamberg)
Schnurkeramik im Mittelelbe-Saale-Gebiet. Versuch einer räumlichen, sozialen und chronologischen Differenzierung

2003

Furholt, Martin (Bamberg)
Die absolutchronologische Datierung der Schnurkeramik in Mitteleuropa

Wilde, Ulrike (Bamberg)
Studien zur Bestattungssitte in der frühen Hallstattzeit

2002

Seregély, Timo (Bamberg)
Endneolithikum und ältere Frühbronzezeit in Oberfranken

2001

Eberhardt, Gisela (Berlin)
Zur Neolithisierung einer brandenburgischen Kleinregion.
Von der Linienbandkeramik zur Trichterbecherkultur am Oberlauf der Nuthe südlich von Jüterbog

GRABUNGEN UND PROSPEKTIONEN VON JOHANNES MÜLLER / EXCAVATIONS AND SURVEYS BY JOHANNES MÜLLER

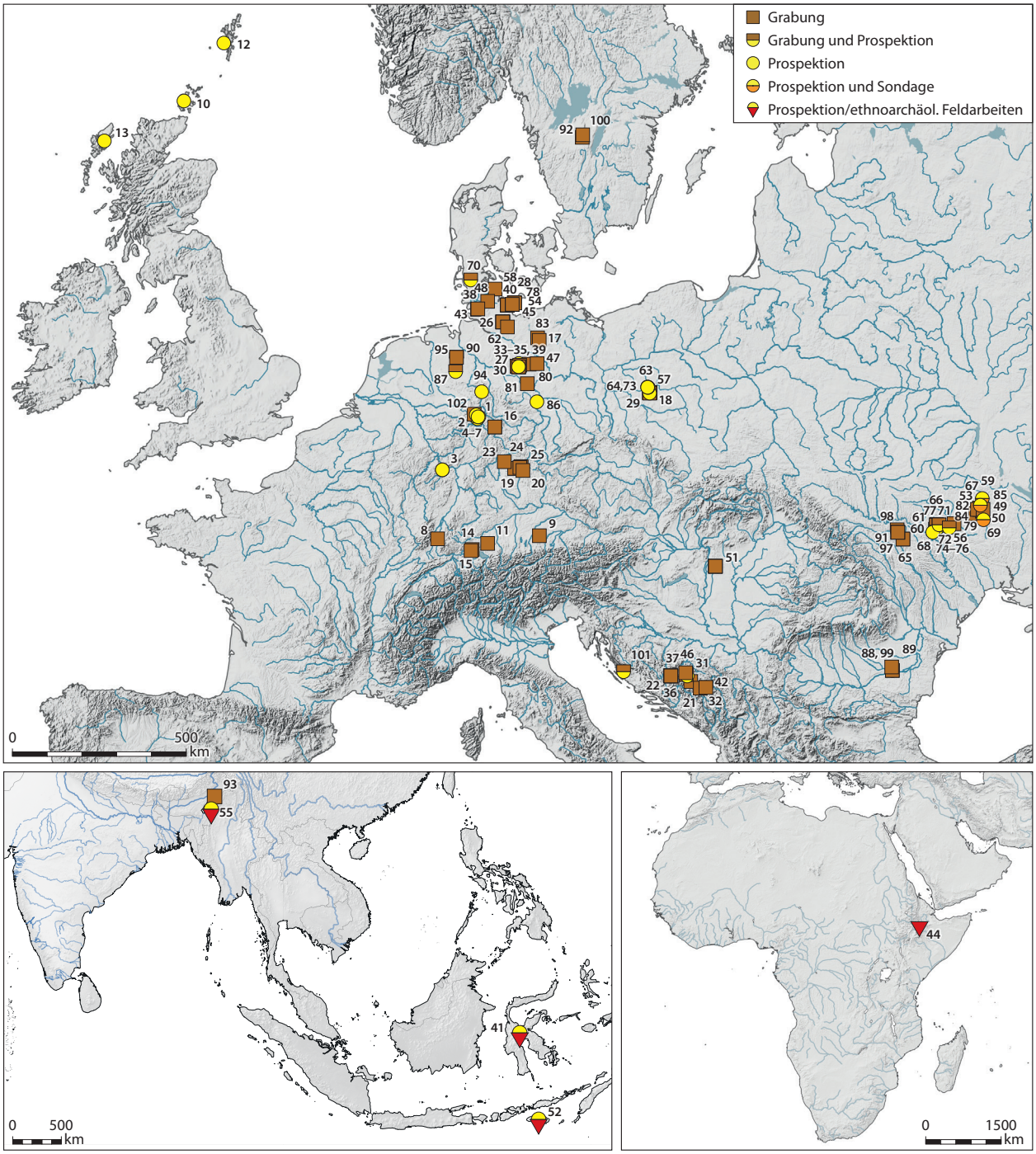

Abb. 1. Übersicht über die zahlreichen Grabungen und Prospektionen von Johannes Müller – hier eine Auswahl. Nummerierung nach Liste auf den folgenden Seiten (Grafik: Carsten Reckweg).

No.	Fundstelle/Fundregion	Land	Jahr von	Jahr bis	Projekt	Art der Maßnahme
1	Breuna	Hessen	1972		Jugendlicher Archäologie Verband	Prospektion
2	Heidelbeerenberg	Hessen	1972		Jugendlicher Archäologie Verband	Prospektion
3	Stromberg	Hessen	1972	und 1973	Jugendlicher Archäologie Verband	Prospektion
4	Burghasungen	Hessen	1973		Jugendlicher Archäologie Verband	Prospektion
5	Naturpark Habichtswald	Hessen	1973		Jugendlicher Archäologie Verband	Prospektion
6	Zierenberg	Hessen	1973		Jugendlicher Archäologie Verband	Prospektion
7	Wettesinger Gemeindewald	Hessen	1974		Jugendlicher Archäologie Verband	Prospektion
8	Breisach	Baden-Württemberg	1980er		als Student	Grabung
9	Bayern	Bayern	1980er		als Student	Grabung
10	Orkney	Schottland	1980er		Magisterarbeit	Prospektion
11	Reute	Baden-Württemberg	1980er		als Student	Grabung
12	Shetland Inseln	Schottland	1980er		Magisterarbeit	Prospektion
13	Western Isles, Hebriden	Schottland	1980er		Magisterarbeit	Prospektion
14	Hornstaad	Baden-Württemberg	1987		als Student	Grabung
15	Allensbach	Baden-Württemberg	1988		als Student	Grabung
16	Boyneburg	Hessen	1994	bis 1995	Lehrgrabung FU	Grabung
17	Tessenow	Mecklenburg-Vorpommern	1996		Lehrgrabung FU	Grabung
18	Bruszczewo	Polen	1999	2001, 2003–2008, 2015	Bruszczewo-Projekt	Grabung
19	Baunach-Hahnleite, Lkr. Bamberg	Bayern	2000	bis 2001	Lehrgrabung Bamberg	Grabung
20	Voitmannsdorf, Lkr. Bamberg	Bayern	2001		Lehrgrabung Bamberg	Grabung
21	Butmir	Bosnien-Herzegowina	2002		Okoliste Projekt	Grabung
22	Okolište	Bosnien-Herzegowina	2002	bis 2007	Okoliste Projekt	Grabung
23	Wettringen, Lkr. Schweinfurt	Bayern	2002		Lehrgrabung Bamberg	Grabung
24	Motzenstein bei Wattendorf, Lkr. Bamberg	Bayern	2003	bis 2004	Lehrgrabung Bamberg	Grabung
25	Stübig-Rothensteine, Lkr. Bamberg	Bayern	2003		Lehrgrabung Bamberg	Grabung
26	Bad Oldesloe "Wolkenwehe" LA 154	Schleswig-Holstein	2006	bis 2009	Lehrgrabung Kiel	Grabung
27	Altmark	Sachsen-Anhalt	2006		Praktikum	Prospektion
28	Oldenburg LA 255; Kr. Ostholstein	Schleswig-Holstein	2005		Lehrgrabung Kiel	Grabung

Grabungsleitung vor Ort (Kiel)	**Kooperationspartner (vor Ort)**	**Art der Fundstelle**	**Institution**
Johannes Müller		Verschiedenes, u.a. Neolithikum	Jugendlicher Archäologie Verband
Johannes Müller		Verschiedenes, u.a. Neolithikum	Jugendlicher Archäologie Verband
Johannes Müller		Verschiedenes, u.a. Neolithikum	Jugendlicher Archäologie Verband
Johannes Müller		Verschiedenes, u.a. Neolithikum	Jugendlicher Archäologie Verband
Johannes Müller		Verschiedenes, u.a. Neolithikum	Jugendlicher Archäologie Verband
Johannes Müller		Verschiedenes, u.a. Neolithikum	Jugendlicher Archäologie Verband
Johannes Müller		Verschiedenes, u.a. Neolithikum	Jugendlicher Archäologie Verband
Gerhard Fingerlin		Römische Siedlung	
Barbara Ottaway		Neolithische Siedlung	
Johannes Müller		Megalithgräber	
Martin Mainberger		Neolithische Feuchtbodensiedlung	
Johannes Müller		Megalithgräber	
Johannes Müller		Megalithgräber	
Bodo Dieckmann		Neolithische Feuchtbodensiedlung	
Eckhard Czarnetzki		Neolithische Feuchtbodensiedlung	
Johannes Müller		Mittelalterliche und latènezeitliche Siedlung	FU-Berlin
Johannes Müller	Landesamt für Kultur und Denkmalpflege Mecklenburg-Vorpommern	Feuchtbodensiedlung	FU-Berlin
Jutta Kneisel, Johannes Müller, Christoph Schilz	Janusz Czebreszuk (Adam-Mickiewicz-University Poznań), Slawomir Kadrow (Maria Curie-Skłodowska University Lublin)	Frühbronzezeitliche befestigte Siedlung im Feuchtboden	FU-Berlin
Timo Seregély		Frühbronzezeitliche Siedlung	Uni Bamberg
Brigitte Lohrke		Spät-/endneolithische Siedlung	Uni Bamberg
Robert Hofmann	Zilka Kujundžić-Vejzagić (Zemaljski muzej Bosne i Hercegovine), Knut Rassmann (Römisch-Germanische Kommission)	Spätneolithische Siedlung	Uni Bamberg
Johannes Müller, Knut Rassmann, Robert Hofmann	Zilka Kujundžić-Vejzagić (Zemaljski muzej Bosne i Hercegovine), Knut Rassmann (Römisch-Germanische Kommission)	Spätneolithische Siedlung	Uni Bamberg
Ulrike Wilde		Hallstattzeitlicher Grabhügel	Uni Bamberg
Timo Seregély		Endneolithische Siedlung und ritueller Platz	Uni Bamberg
Timo Seregély		Ritueller Platz, Neolithikum und Metallzeiten	Uni Bamberg
Doris Mischka, Martin Hinz (2009)		Neolithische Moorsiedlung im Brenner Moor	Uni Kiel
Johannes Müller	Barbara Fritsch (LDA, Halle/Saale)	Megalithgräber	Uni Kiel
Doris Mischka		Neolithische Moorsiedlung im Oldenburger Graben	Uni Kiel

No.	Fundstelle/Fundregion	Land	Jahr von	Jahr bis	Projekt	Art der Maßnahme
29	Stare Bojanowo	Polen	2006		Bruszczewo-Projekt	Grabung und Prospektion
30	Lüdelsen 3	Sachsen-Anhalt	2007		Megalithlandschaft Altmark	Grabung und Prospektion
31	Donje Moštre	Bosnien-Herzegowina	2008		Okoliste Projekt	Grabung
32	Kundruci	Bosnien-Herzegowina	2008		Okoliste Projekt	Grabung
33	Rohrberg Katinkenburg	Sachsen-Anhalt	2008		Megalithlandschaft Altmark	Grabung
34	Tangeln Kindergarten	Sachsen-Anhalt	2008	und 2011	Megalithlandschaft Altmark	Grabung
35	Tangeln Silberberg	Sachsen-Anhalt	2008		Megalithlandschaft Altmark	Prospektion
36	Visoko-Region	Bosnien-Herzegowina	2008		Okoliste Projekt	Prospektion
37	Zagrebnice	Bosnien-Herzegowina	2008		Okoliste Projekt	Grabung
38	Büdelsdorf Brutkamp	Schleswig-Holstein	2009		SPP 1400	Grabung
39	Lüdelsen 6 Königsgrab	Sachsen-Anhalt	2009	bis 2010	Megalithlandschaft Altmark	Grabung
40	Oldenburg-Dannau LA 77	Schleswig-Holstein	2009	bis 2012	SPP 1400	Grabung
41	Sulawesi	Indonesien	2009		DAAD deutsch-indonesischer Wissenschaftsaustausch	Prospektion
42	Zupčići-Jagnilo b. Goražde	Bosnien-Herzegowina	2009		Okoliste Projekt	Grabung und Prospektion
43	Albersdorf Dieksknöll	Schleswig-Holstein	2010		SPP 1400	Grabung
44	Äthiopien	Äthiopien	2010		Graduiertenschule Human development in Landscape	Prospektion
45	Wangels LA 69	Schleswig-Holstein	2010	bis 2013	SPP 1400	Grabung
46	Zupčići-Jagnilo b. Goražde	Bosnien-Herzegowina	2011		Okoliste Projekt	Grabung
47	Düsedau	Sachsen-Anhalt	2012		Megalithlandschaft Altmark	Grabung
48	Büdelsdorf Borgstedt LA 1	Schleswig-Holstein	2013		SPP 1400	Grabung
49	Maidanetske	Ukraine	2013	2014, 2016	Trypillia-Projekt	Grabung
50	Grebenjukiv Jar	Ukraine	2014	und 2016	Trypillia-Projekt	Grabung und Prospektion
51	Kakusz	Ungarn	2014	bis 2017	Kekx Projekt	Grabung
52	Sumba	Indonesien	2015		SPP 1400	Prospektion/ ethnoarch. Feldarbeiten

Grabungsleitung vor Ort (Kiel)	**Kooperationspartner (vor Ort)**	**Art der Fundstelle**	**Institution**
Jutta Kneisel	Janusz Czebreszuk (Adam-Mickiewicz-University Poznań)	Frühbronzezeitliche Siedlung	Uni Kiel
Denis Demnick, Sarah Diers	Barbara Fritsch (LDA, Halle/Saale)	Megalithgrab	Uni Kiel
Robert Hofmann	Zilka Kujundžić-Vejzagić (Zemaljski muzej Bosne i Hercegovine), Knut Rassmann (Römisch-Germanische Kommission)	Spätneolithische Siedlung	Uni Kiel
Martin Furholt	Zilka Kujundžić-Vejzagić (Zemaljski muzej Bosne i Hercegovine), Knut Rassmann (Römisch-Germanische Kommission)	Spätneolithische Siedlung	Uni Kiel
Denis Demnick	Barbara Fritsch (LDA, Halle/Saale)	Neolithische Siedlung	Uni Kiel
Denis Demnick	Barbara Fritsch (LDA, Halle/Saale)	Neolithische Siedlung	Uni Kiel
Denis Demnick	Barbara Fritsch (LDA, Halle/Saale)	Siedlung	Uni Kiel
Robert Hofmann, Nils-Müller-Scheeßel	Zilka Kujundžić-Vejzagić (Zemaljski muzej Bosne i Hercegovine), Knut Rassmann (Römisch-Germanische Kommission)	Neolithische Siedlung	Uni Kiel
Nils Müller-Scheeßel	Zilka Kujundžić-Vejzagić (Zemaljski muzej Bosne i Hercegovine), Knut Rassmann (Römisch-Germanische Kommission)	Spätneolithische Siedlung	Uni Kiel
Hauke Dibbern, Franziska Hage		Megalithgrab	Uni Kiel
Denis Demnick	Barbara Fritsch (LDA, Halle/Saale)	Megalithgrab	Uni Kiel
Jan Piet Brozio		Neolithische Siedlung	Uni Kiel
Wiebke Kirleis		Umweltgeschichte von Zentral Sulawesi	Uni Kiel
Robert Hofmann, Nils-Müller-Scheeßel	Zilka Kujundžić-Vejzagić (Zemaljski muzej Bosne i Hercegovine), Knut Rassmann (Römisch-Germanische Kommission)	Spätneolithische Siedlung	Uni Kiel
Hauke Dibbern, Franziska Hage		Grabenwerk	Uni Kiel
Engdawork Assefa		Ethnoarchäologischer Survey	Uni Kiel
Jan Piet Brozio		Megalithgrab	Uni Kiel
Robert Hofmann	Ana Marić (Zemaljski muzej Bosne i Hercegovine)	Spätneolithische Siedlung	Uni Kiel
Tim Grünewald	Barbara Fritsch (LDA, Halle/Saale)	Neolitische Siedlung	Uni Kiel
Hauke Dibbern, Franziska Hage		Grabenwerk	Uni Kiel
Robert Hofmann, Heiko Tiede	Mykhailo Videiko (Institute of Archaeology of the National Academy of Science of Ukraine), Knut Rassmann (Römisch-Germanische Kommission)	Kupferzeitliche Trypillia-Siedlung	Uni Kiel
Robert Hofmann, Heiko Tiede	Mykhailo Videiko (Institute of Archaeology of the National Academy of Science of Ukraine), Knut Rassmann (Römisch-Germanische Kommission)	Kupferzeitliche Trypillia-Siedlung	Uni Kiel
Nicole Taylor	Gabriella Kulcsár (Hungarian Academy of Sciences, Budapest), Mateusz Jaeger (Adam-Mickiewicz-University Poznań)	Mittelbronzezeitliche befestigte Siedlung	Uni Kiel
Maria Wunderlich, Johannes Müller	Knut Rassmann (Römisch- Germanische Kommission)	Erfassung und Untersuchung moderner megalithischer Grabmonumente	Uni Kiel

No.	Fundstelle/Fundregion	Land	Jahr von	Jahr bis	Projekt	Art der Maßnahme
53	Moshuriv 1	Ukraine	2016		Trypillia-Projekt	Grabung
54	Oldenburg LA 232	Schleswig-Holstein	2016		SFB 1266	Grabung und Prospektion
55	Phek (Nagaland)	Indien	2016	und 2018	SPP 1400	Prospektion/ ethnoarch. Feldarbeiten
56	Vitiivka	Ukraine	2016		Trypillia-Projekt	Grabung
57	Wilanowo 12, bei Leki Male	Polen	2016		Únětice North-Projekt	Prospektion
58	Brodersby-Schönhagen	Schleswig-Holstein	2017		SFB 1266	Grabung
59	Chizhivka	Ukraine	2017		Trypillia-Projekt	Prospektion und Sondage
60	Hariachkivka 2	Ukraine	2017		Trypillia-Projekt	Grabung und Prospektion
61	Krynychky	Ukraine	2017		Trypillia-Projekt	Grabung und Prospektion
62	Labenz LA 11 (Duvensee)	Schleswig-Holstein	2017		SFB 1266	Grabung
63	Leki Male	Polen	2017		Únětice North-Projekt	Prospektion
64	Wolkowo, Umgebung, Fundplatz A	Polen	2017		Únětice North-Projekt	Prospektion
65	Stolniceni	Moldawien	2017	und 2019	Trypillia-Projekt	Grabung
66	Ternivka	Ukraine	2017		Trypillia-Projekt	Grabung und Prospektion
67	Veselyj Kut	Ukraine	2017		Trypillia-Projekt	Prospektion und Sondage
68	Vilshanka	Ukraine	2017		Trypillia-Projekt	Prospektion
69	Volodymyrivka	Ukraine	2017		Trypillia-Projekt	Prospektion und Sondage
70	Westre	Schleswig-Holstein	2017		SFB 1266	Grabung und Prospektion
71	Zabolotne	Ukraine	2017		Trypillia-Projekt	Grabung und Prospektion
72	Bilyi Kamin	Ukraine	2018		Trypillia-Projekt	Grabung und Prospektion
73	Wolkowo, Umgebung, Fundplatz B–C	Polen	2017	bis 2018	Únětice North-Projekt	Prospektion
74	Hariachkivka 3	Ukraine	2018	bis 2019	Trypillia-Projekt	Grabung und Prospektion
75	Hariachkivka 7	Ukraine	2018	bis 2019	Trypillia-Projekt	Grabung und Prospektion
76	Hariachkivka 8	Ukraine	2018	bis 2019	Trypillia-Projekt	Grabung und Prospektion
77	Kisnytsia	Ukraine	2018		Trypillia-Projekt	Grabung und Prospektion

Grabungsleitung vor Ort (Kiel)	Kooperationspartner (vor Ort)	Art der Fundstelle	Institution
Robert Hofmann	Mykhailo Videiko (Borys Grinchenko Kyiv University)	Kupferzeitliche Trypillia-Siedlung	Uni Kiel
Jan Piet Brozio		Neolithischer Siedlungsplatz	Uni Kiel
Maria Wunderlich, Johannes Müller	Tiatoshi Jamir und Ditamulü Vasa (Nagaland University), Knut Rassmann (Römisch-Germanische Kommission)	Erfassung und Untersuchung moderner megalithischer Monumente	Uni Kiel
Robert Hofmann	Vitalii Rud (Institute of Archaeology of the National Academy of Science of Ukraine)	Kupferzeitliche Trypillia-Siedlung	Uni Kiel
Hendrik Raese	Janusz Czebreszuk (Adam-Mickiewicz-University Poznań)	Frühbronzezeitliche Siedlung	Uni Kiel
Jan Piet Brozio		Jungneolithische Siedlung	Uni Kiel
Robert Hofmann, Liudmyla Shatilo	Vitalii Otroshchenko (Institute of Archaeology of the National Academy of Science of Ukraine)	Kupferzeitliche Trypillia-Siedlung	Uni Kiel
Robert Hofmann	Vitalii Rud (Institute of Archaeology of the National Academy of Science of Ukraine)	Kupferzeitliche Trypillia-Siedlung	Uni Kiel
Robert Hofmann	Vitalii Rud (Institute of Archaeology of the National Academy of Science of Ukraine)	Kupferzeitliche Trypillia-Siedlung	Uni Kiel
Jan Piet Brozio		Neolithischer Siedlungsplatz	Uni Kiel
Hendrik Raese	Janusz Czebreszuk (Adam-Mickiewicz-University Poznań)	Frühbronzezeitliches Grabhügelareal	Uni Kiel
Hendrik Raese	Janusz Czebreszuk (Adam-Mickiewicz-University Poznań)	Frühbronzezeitliches Grabhügelareal	Uni Kiel
Robert Hofmann	Stanislav Ţerna (University 'High Anthropological School' Chisinau); Knut Rassmann (Römisch-Germanische Kommission)	Kupferzeitliche Trypillia-Siedlung	Uni Kiel
Robert Hofmann	Vitalii Rud (Institute of Archaeology of the National Academy of Science of Ukraine)	Kupferzeitliche Trypillia-Siedlung	Uni Kiel
Robert Hofmann, Liudmyla Shatilo	Vitalii Otroshchenko (Institute of Archaeology of the National Academy of Science of Ukraine)	Kupferzeitliche Trypillia-Siedlung	Uni Kiel
Robert Hofmann	Vitalii Rud (Institute of Archaeology of the National Academy of Science of Ukraine)	Kupferzeitliche Trypillia-Siedlung	Uni Kiel
Robert Hofmann, Liudmyla Shatilo	Vitalii Otroshchenko (Institute of Archaeology of the National Academy of Science of Ukraine)	Kupferzeitliche Trypillia-Siedlung	Uni Kiel
Jan Piet Brozio		Neolithischer Siedlungsplatz	Uni Kiel
Robert Hofmann	Vitalii Rud (Institute of Archaeology of the National Academy of Science of Ukraine)	Kupferzeitliche Trypillia-Siedlung	Uni Kiel
Robert Hofmann	Vitalii Rud (Institute of Archaeology of the National Academy of Science of Ukraine)	Kupferzeitliche Trypillia-Siedlung	Uni Kiel
Hendrik Raese	Janusz Czebreszuk (Adam-Mickiewicz-University Poznań), Slawomir Kadrow (Maria Curie-Skłodowska University Lublin)	Frühbronzezeitliche Siedlung	Uni Kiel
Robert Hofmann	Vitalii Rud (Institute of Archaeology of the National Academy of Science of Ukraine)	Kupferzeitliche Trypillia-Siedlung	Uni Kiel
Robert Hofmann	Vitalii Rud (Institute of Archaeology of the National Academy of Science of Ukraine)	Kupferzeitliche Trypillia-Siedlung	Uni Kiel
Robert Hofmann	Vitalii Rud (Institute of Archaeology of the National Academy of Science of Ukraine)	Kupferzeitliche Trypillia-Siedlung	Uni Kiel
Robert Hofmann	Vitalii Rud (Institute of Archaeology of the National Academy of Science of Ukraine)	Kupferzeitliche Trypillia-Siedlung	Uni Kiel

No.	Fundstelle/Fundregion	Land	Jahr von	Jahr bis	Projekt	Art der Maßnahme
78	Oldenburg LA 255; Kr. Ostholstein	Schleswig-Holstein	2018		SFB 1266	Grabung
79	Apolianka	Ukraine	2019		Trypillia-Projekt	Grabung
80	Brunau	Sachsen Anhalt	2019		SFB 1266	Grabung
81	Hundisburg Olbetal	Sachsen-Anhalt	2019		Lehrgrabung Kiel	Grabung
82	Moshuriv 2	Ukraine	2019		Trypillia-Projekt	Grabung
83	Parchim-Löddigsee	Mecklenburg-Vorpommern	2019		SFB1266	Grabung
84	Rohy	Ukraine	2019		Trypillia-Projekt	Grabung
85	Talne 3	Ukraine	2019		Trypillia-Projekt	Grabung
86	Baalberge Schneiderberg	Sachsen-Anhalt	2020		Roots	Prospektion
87	Hunte IV	Niedersachsen	2020		Dümmer Projekt (SFB 1266)	Grabung und Prospektion
88	Chiselet	Rumänien	2021	bis 2022	Trypillia-Projekt	Grabung und Prospektion
89	Sultana-Malu Roşu und Gheţărie	Rumänien	2021		Trypillia-Projekt	Grabung
90	Hunte I	Niedersachsen	2022	bis 2023	Dümmer Projekt (SFB 1266)	Grabung und Prospektion
91	Trinca-La Şanţ	Moldawien	2022	bis 2024	Trypillia-Projekt	Grabung
92	Backgården dolmen, Falbygden	Schweden	2023		SFB 1266	Grabung
93	Mon (Nagaland)	Indien	2023		SFB1266	Prospektion/ ethnoarch. Feldarbeiten
94	Börry	Niedersachsen	2024		Institutsprojekt	Prospektion
95	Diepholz	Niedersachsen	2024		Dümmer Projekt (SFB 1266)	Grabung und Prospektion
96	Mon (Nagaland)	Indien	2024	bis 2025	ERC	Grabung
97	Trinca-Bulhac	Moldawien	2024		Trypillia-Projekt	Prospektion und Sondage
98	Caracuşenii Vechi 4	Moldawien	2025		Trypillia-Projekt	Grabung und Prospektion
99	Chiselet	Rumänien	2025		SFB1266	Grabung
100	Dala 81:2, Falbygden	Schweden	2025		SFB 1266	Grabung
101	Smilčić-Dugače	Kroatien	2025		Institutsprojekt	Grabung und Prospektion
102	Volkmarsen	Hessen	2025		SFB1266	Grabung

Grabungsleitung vor Ort (Kiel)	Kooperationspartner (vor Ort)	Art der Fundstelle	Institution
Jan Piet Brozio		Neolithischer Siedlungsplatz	Uni Kiel
Robert Hofmann	Mykhailo Videiko (Borys Grinchenko Kyiv University), Vitalii Rud (Institute of Archaeology of the National Academy of Science of Ukraine)	Kupferzeitliche Trypillia-Siedlung	Uni-Kiel
Annalena Pfeifer	Barbara Fritsch (LDA, Halle/Saale)	Neolithisches Gräberfeld	Uni Kiel
Maria Wunderlich	Barbara Fritsch (LDA, Halle/Saale)	Bronzezeitliche Siedlung	Uni Kiel
Robert Hofmann	Mykhailo Videiko (Borys Grinchenko Kyiv University), Vitalii Rud (Institute of Archaeology of the National Academy of Science of Ukraine)	Kupferzeitliche Trypillia-Siedlung	Uni Kiel
Jan Piet Brozio	Landesamt für Kultur und Denkmalpflege Mecklenburg-Vorpommern	Jungneolithische Siedlung	Uni Kiel
Robert Hofmann	Mykhailo Videiko (Borys Grinchenko Kyiv University), Vitalii Rud (Institute of Archaeology of the National Academy of Science of Ukraine)	Kupferzeitliche Trypillia-Siedlung	Uni Kiel
Robert Hofmann	Mykhailo Videiko (Borys Grinchenko Kyiv University), Vitalii Rud (Institute of Archaeology of the National Academy of Science of Ukraine)	Kupferzeitliche Trypillia-Siedlung	Uni Kiel
Dennis Wilken, Manuel Zolchow	Barbara Fritsch (LDA, Halle/Saale)	Neolithischer Grabhügel	Uni Kiel
Jan Piet Brozio		Neolithischer Siedlungsplatz (Glockenbecher)	Uni Kiel
Johannes Müller, Robert Hofmann	Catalin Lazar (University of Bucharest) u.a.	Kupferzeitliche Gumelnita-Tellsiedlung	Uni Kiel
Johannes Müller/ Robert Hofmann	Catalin Lazar (University of Bucharest) u.a.	Boian und Gumelnita-Tell- und Flachsiedlung	Uni Kiel
Jan Piet Brozio		Neolithische Siedlung	Uni Kiel
Robert Hofmann	Ghenadie Sirbu (State University of Moldova, Chisinau)	Kupferzeitliche Trypillia-Siedlung	Uni Kiel
Johannes Müller	Karl-Göran Sjögren (University of Gothenburg)	Megalithgrab	Uni Kiel
Maria Wunderlich, Johannes Müller	Tiatoshi Jamir und Ditamulü Vasa (Nagaland University)	Erfassung und Untersuchung moderner megalithischer Monumente	Uni Kiel
Fynn Wilkes, Henry Skorna		Neolitisches Erdwerk	Uni Kiel
Jan Piet Brozio		Neolithischer Bohlenweg	Uni Kiel
Giacomo Bilotti, Tiatoshi Jamir, Dam Vasa, Johannes Müller	Tiatoshi Jamir und Ditamulü Vasa (Nagaland University)	Megalithanlage, in Verbindung mit dem Haus des Königs oder Angh	Uni Kiel
Robert Hofmann	Ghenadie Sirbu (State University of Moldova, Chisinau)	Kupferzeitliche Trypillia-Siedlung	Uni Kiel
Julia Dietrich, Ann-Katrin Klein, Clemens Kruckenberg	Ghenadie Sirbu (State University of Moldova, Chisinau)	Kupferzeitliche Trypillia-Siedlung	Uni Kiel
Robert Hofmann	Catalin Lazar (University of Bucharest) u.a.	Kupferzeitliche Gumelnita-Tellsiedlung	Uni Kiel
Johannes Müller	Karl-Göran Sjögren (University of Gothenburg)	Megalithgrab	Uni Kiel
Henry Skorna, Fynn Wilkes		Neolithische Kreisgrabenanlage und Siedlungsplätze in Norddalmatien (Region Benkovac)	Uni Kiel
Christoph Rinne		Grabenanlage	Uni Kiel

Foreword

A Haunting Spectre – Archaeological Studies of Social Organisation, Economic Practice, and Inequality

Martin Furholt, Jutta Kneisel, Wiebke Kirleis

EINLEITUNG

Johannes Müller ist mit Leib und Seele Archäologe. Bereits als Jugendlicher, so wird berichtet, untersuchte er Grabhügel, hielt Vorträge vor seinen Freunden und gab die Zeitschrift Querschnitt heraus, vervielfältigt auf dem heimischen Matrizendrucker. Dieses Engagement hat sich bis heute nicht geändert, nur der Maßstab ist größer, wesentlich größer, geworden. Auf seinen beruflichen Stationen, ob als Assistent an der Freien Universität Berlin, als Professor in Bamberg und dann in Kiel, hat er stets Neues auf den Weg gebracht, Projekte initiiert, Infrastrukturen geschaffen und den jeweiligen Institutionen wie auch den beteiligten Kolleg:innen und Schüler:innen nachhaltig seinen Stempel aufgedrückt. In Berlin begründete er die bis heute andauernde Kooperation mit den polnischen Kolleg:innen; in seiner kurzen Zeit in Bamberg etablierte er eigene Institutsräume und eine Bibliothek für die Ur- und Frühgeschichte. Im und um das Institut für Ur- und Frühgeschichte in Kiel entwickelte er zielstrebig ein deutschlandweit einzigartiges und europaweit anerkanntes Zentrum für archäologische Mensch-Umwelt-Forschung, mit wiederholten Erfolgen bei Verbundprojektanträgen und in der Exzellenzinitiative bzw. -strategie des Bundes und der Länder. Strukturell verwirklicht er Interdisziplinarität mittels der Integration geistes- und naturwissenschaftlicher Herangehensweisen, inhaltlich adressiert er die großen Fragen gesellschaftlicher Entwicklungen, und deren Erforschung auf verschiedenen Skalenebenen: Soziale Ungleichheit und soziale Organisation, die Konsequenzen sich wandelnder Subsistenzstrategien und ökonomischer Verhältnisse, die Beziehung zu und die Ausbeutung der Umwelt in der Vergangenheit.

Weiterhin bemüht er sich aktiv um die Überwindung eurozentrischer Sichtweisen bei der Untersuchung der Menschheitsgeschichte. Dies hat sich vor allem in seinen ethnoarchäologischen Forschungen in Äthiopien, Indonesien und dem nordostindischen Nagaland niedergeschlagen, die er stets im interkulturellen Austausch mit lokalen Kolleg:innen und indigenen Gemeinschaften umgesetzt hat. Sein Wirken hat wesentlich dazu beigetragen, den Übergang unseres Fachs von einer deutschen und eher konservativen Ur- und Frühgeschichte hin zur heutigen international vernetzten und Impulse setzenden integrativen prähistorischen Archäologie zu ermöglichen.

Ein Johannes Müller sehr wichtiges Anliegen in der internationalen Forschung ist die partnerschaftliche Zusammenarbeit, die ihren Ausdruck in gegenseitigem voneinander Lernen hat. In diesem Sinne hat er enge Kooperationen mit zahlreichen Kolleg:innen an den Universitäten und Akademien in Polen, Bosnien-Herzegowina, der Ukraine, Moldawien, Rumänien, Ungarn, Schweden, England, Kroatien, Spanien und Indien etabliert, die langjährige Forschungen begründet haben. Johannes Müllers umfassende internationale fachliche Vernetzung manifestierte sich nicht zuletzt in seinen Forschungen und Projekten an der Universität Kiel. Zu nennen sind unter anderem: gemeinsame Forschungsprojekte mit den polnischen Kolleg:innen Janusz Czebreszuk und Marzena Szmyt im „Beethoven-Projekt: UNETICE NORTH – Spätneolithisch-frühbronzezeitliche Entwicklungen im südwestbaltischen Raum (2500–1500 v. Chr.). Warum entstehen Machtstrukturen vom Typ Bruszczewo-Łęki Małe?“ (2015–2019); das Projekt „Spätneolithische Siedlungsprozesse in Zentralbosnien“ mit Zilka Kujundžić-Vejzagić und Knut Rassmann vom Nationalmuseum Bosnien- und Herzegowinas und dem DAI Frankfurt a. M.; das „*Forging Identities: The Mobility of Culture in Bronze Age Europe*“ – Projekt der Universität Aarhus mit Helle Vandkilde gemeinsam mit Marie Louise Stig Sørensen, Kristian Kristiansen, Joanna Sofaer, Kostas Kotsakis, Svend Hansen von den Universitäten Cambridge, Göteborg, Southampton, Thessaloniki und dem DAI-Berlin; das Projekt „Population Agglomerations at Trypillia-Cucuteni

Mega-sites“ in der Ukraine und Moldawien gemeinsam mit Mykhailo Videiko, Vitalii Rud, Vladislav Chabanyuk, Stanislav Țerna, Ghenadie Sîrbu, Sergiu Hegheа und Knut Rassmann von der Borys Grinchenko Kyiv University, dem Institute of Archaeology der Nationalen Akademie der Wissenschaften der Ukraine, dem Museum der Trypillia-Kultur in Lehedzyne, der High Anthropological School University in Chișinău, der staatlichen Universität Moldawiens und dem Zentrum für Archäologie des Instituts für das kulturelle Erbe Moldawiens; das ERC-Projekt *„Xscape: Material Minds“* (2021–2027) mit Felipe Criado Boado, Luis M. Martínez und Andy Clark in Kooperation zwischen der Universität Sussex und dem spanischen Forschungsrat (Consejo Superior de Investigaciones Científicas) und viele mehr.

Seine Weltläufigkeit findet ihren Ausdruck in der Integration ethnoarchäologischer Studien in seine Projekte, u.a. in Äthiopien, Indonesien und Indien. Gleichzeitig dienen die gemeinsamen Projekte sowohl dem fachwissenschaftlichen als auch dem interkulturellen Austausch zwischen Studierenden der beteiligten Universitäten, der Entwicklung und Vermittlung neuer Methoden der Archäologie sowie der Veröffentlichung gemeinsamer, angesehener und international beachteter Publikationen.

In seinem Wirken an der Universität Kiel wird sein strategisches Geschick sichtbar. Sukzessive und systematisch hat Johannes Müller mit großem Einsatz die Ur- und Frühgeschichte ausgebaut, als Keimzelle für den universitären Forschungsschwerpunkt SECC mit der Johanna-Mestorf-Akademie als zentraler universitärer Einrichtung, die Großprojekte bündelt und die Erforschung vergangener Gesellschaften und ihrer Umwelten nachhaltig als Schwerpunktthema an der Kieler Universität manifestiert. Der Spannungsbogen des Erfolgs beginnt mit der Vorbereitung eines Exzellenzantrags für eine Graduiertenschule unmittelbar, nachdem Johannes Müller den Ruf nach Kiel angenommen hat. Im Rahmen der deutschen Exzellenzinitiative seit dem Jahr 2007 leitete Johannes Müller die Graduiertenschule „Human Development in Landscapes“ (2007–2019). Die Graduiertenschule zog eine Vielzahl internationaler Doktorand:innen und Postdocs nach Kiel. Die von Johannes Müller betreuten Dissertationen erstreckten sich von Südamerika bis zu den Steppenregionen Kasachstans und des Kaukasus sowie von Schweden bis Menorca. Neben der Graduiertenausbildung brennt Johannes Müller für die Forschungsinhalte — Megalithik ein ständiger Begleiter. Er initiierte das Schwerpunktprogramm SPP 1400 „Frühe Monumentalität und soziale Differenzierung. Zur Entstehung und Entwicklung neolithischer Großbauten und erster komplexer Gesellschaften im nördlichen Mitteleuropa“ (2009–2015). Unter anderem daraus erwuchs der Sonderforschungsbereich SFB 1266 „TransformationsDimensionen. Mensch-Umwelt Wechselwirkungen in Prähistorischen und Archaischen Gesellschaften“ (2016–2024). In der Exzellenzinitiative des Bundes und der Länder gelang erfolgreich der Sprung von einer Graduiertenschule in die Förderung des Exzellenzclusters EXC 2150 „ROOTS – Konnektivität von Gesellschaft, Umwelt und Kultur in vergangenen Welten“ (2019–2025), in deren Rahmen eine Vielzahl internationaler Projekte durchgeführt wurden und werden. Letzterer wirkt mit der erfolgreichen Folgeantragstellung nach bis zum Jahr 2032. Die Umsetzung der Forschungsziele erfolgt von kleinregional orientierten Einzelprojekten, die sich in der logischen Folge als Basis zur Erforschung von Meso- und Makroregionen entwickeln und dem Studium menschlichen Verhaltens in vergangenen Gesellschaften und Umwelten gewidmet sind, immer mit Bezug zu aktuellen politischen Themen wie soziale Ungleichheit, Wissenstransfer, Klimaveränderungen oder Konfliktbewältigung. Denn die Analyse vergangener Gesellschaften ermöglicht, so Johannes Müllers Überzeugung, ein besseres Verständnis aktueller gesellschaftlicher Entwicklungen und hilft so bei der Einschätzung zukünftiger Entwicklungen.

Johannes Müllers Engagement für die europäische und internationale Archäologie wurde mit dem Titel „Honorary Research Associate“ der Universität Cambridge (UK) gewürdigt. Für seine Forschungen zur europäischen Archäologie und zu den ältesten urbanen Strukturen Europas erhielt er in den Jahren 2019 und 2023 den renommierten *„Shanghai Archaeology Award“*. Damit ist Johannes Müller nach dem bekannten britischen Archäologen Colin Renfrew erst der zweite Wissenschaftler, der mit zwei SAF Awards gewürdigt wurde. Er war auch der erste westeuropäische Archäologe, der im Jahr 2022 nach Ausbruch des Krieges in die Ukraine reiste und ein neues Kooperationsabkommen zwischen den Universitäten Kiew und Kiel unterzeichnete.

Johannes Müller ist im wissenschaftlichen Beirat der *European Association of Archaeologists* (EAA), Mitglied der Zentraldirektion des Deutschen Archäologischen Institutes (DAI) und als renommierter Gutachter international gefragt. Er ist verantwortlich für die seit 2009 alle zwei Jahre stattfindende internationale Tagung in Kiel (*Kiel Conference*, zuletzt unter dem Titel *„Scales of Social, Environmental, and Cultural Change in Past Societies“*) und zahlreiche Sessions und Workshops zu europäischen und internationalen Themen. Die daraus resultierenden zahlreichen Tagungsbände und Aufsätze zeigen sein Wirken auf der europäischen und internationalen Bühne.

Wer Johannes Müller persönlich kennt, weiß, dass sich sein archäologisches und professionelles Wirken wesentlich aus seiner tiefen, stark vom Marxismus geprägten, politischen Überzeugung speist, die die heutige von der kapitalistischen Produktionsweise geprägte Gesellschaft zum Besseren verändern will. Uns als Studierenden im Berlin der 1990er Jahre (MF, JK), eröffneten sich neue Dimensionen, als wir plötzlich Themen wie soziale Organisation, Status und Prestige im Vorlesungsverzeichnis lasen. Johannes war schon immer ein „Linker", ein Revolutionär, der aber auch von der Sponti-Bewegung der 1970er und 1980er Jahr nicht unbeeinflusst blieb, was aufgrund seines ebenso ausgeprägten Pragmatismus beim „Gang durch die Institutionen" vielleicht nicht allen immer gewahr wird. Dies ist der Hintergrund, vor dem der Titel dieser Festschrift zu sehen ist — *A Spectre is Haunting Europe — (the spectre of Communism)*, der berühmte Einstieg in Marx und Engels kommunistisches Manifest. Dabei steht dieses Gespenst nicht für Johannes Müller als erfolgreichem Professor, Sprecher und Direktor zahlreicher Verbundprojekte und Exzellenzcluster. Es steht vielmehr für den idealistischen jungen Friedens-, Anti-AKW-Aktivisten und Sozialisten, seinen Drang nach Wandel, der noch immer in seinen Forschungen zum Vorschein kommt und seine wissenschaftliche Tätigkeit wesentlich geprägt hat und weiterhin prägt.

Sein erklärtes Ziel ist der Erkenntnisgewinn zu „*Past societies*", den er in all seinen Projekten zielstrebig vorantreibt. Sei es auf Grabungen, Prospektionen oder am Schreibtisch beim Verfassen von Artikeln. Einen nicht geringen Anteil daran haben statistische Analysen. Eng verbunden mit Johannes Müller ist die Korrespondenzanalyse. Wie schon erwähnt, als vor gut 30 Jahren Johannes Müller als Assistent nach Berlin kam, eröffnete sich eine neue Welt für uns Studierende (MF, JK). Nicht nur, dass auf einmal soziale Organisation zum Thema wurde und Computer in der Bibliothek standen, er machte uns auch mit neuen Analysemethoden vertraut, die sich mit „komplizierten" Programmen wie WinBASP und Geoinformationssystemen wie MapInfo durchführen ließen. Für uns Studierende ergaben sich daraus ungeahnte technische Möglichkeiten. Und so ist es bis heute geblieben. Längst sind die Analysen komplexer geworden, die Programme vielfältiger und seine Schülerinnen und Schüler betreten ganz neue Wege.

Doch bleiben wir bei der Korrespondenzanalyse, die weiterhin zum Standardrepertoire bei Johannes Müller gehört und wenden diese gleich an. Neunundsechzig Beiträge von 127 Autor:innen aus sehr unterschiedlichen Wissenschaftsdisziplinen, angefangen von der Philosophie über Botanik und Zoologie bis hin zur Anthropologie und Geophysik sind in diesem Band versammelt und spiegeln die unterschiedlichen Kooperationen und Themenfelder wider, mit denen sich Johannes Müller im Laufe seiner wissenschaftlichen Tätigkeiten beschäftigt hat. Beim Lesen der zahlreichen Artikel trafen wir auf wiederkehrende Themen und spezifische Schlüsselwörter. Aus der Notwendigkeit heraus diese „bunte Mischung" in eine Reihung zu bringen, die sich, um im archäologischen Jargon zu bleiben, auch als Gliederung bzw. Klassifikation, also letztendlich als ‚Typengliederung', umschreiben lässt, griffen wir auf die altbewährte Korrespondenzanalyse zurück. Und da es keine Analyse ohne eine klare Fragestellung geben darf: Inwiefern lassen sich über die hier abgedruckten Texte Themenkomplexe definieren, und inwiefern spiegeln sie das Werk des Jubilars wider oder stellen Abweichungen von seinen Interessen dar? Schauen wir uns das Ergebnis an.

METHODE

Für die vorliegende Untersuchung wurden 38 Begriffe bzw. Begriffsgruppen ausgewählt, jeweils auf Deutsch oder Englisch. Bei bestimmten Schlüsselwörtern war es notwendig, die Begriffe zu erweitern, wie z. B. Frau – weiblich oder *environment – ecology*, da sie zur gleichen Themengruppe gehören (Liste 1). Anschließend erfolgte eine Abfrage der Texte entweder auf Englisch oder Deutsch. Die Anzahl der Treffer wurde in einer Tabelle nach Autor:innen sortiert erfasst. Ausgangspunkt waren Texte vor der ersten Korrektur bzw. dem ‚Review' einschließlich der Abbildungsunterschriften und des Literaturverzeichnisses. Quellenkritisch ist anzumerken, dass die Schlüsselwörter nur in der gewählten Textsprache (englisch oder deutsch) abgefragt wurden und keine anderssprachige Literaturzitate berücksichtigt werden. Doch scheint dieser Fehler vernachlässigbar. Die Analyse wurde — ganz *retro* — auf einem alten Rechner mit dem Programm WinBASP durchgeführt.

Liste 1. Übersicht über die am häufigsten genutzten Begriffe in diesem Band.

aDNA – aDNA
Botanical/botany – Botanik/botanisch
Bronze Age – Bronzezeit
Chief – Häuptling
Conflict – Konflikt
Demography – Demografie
Development – Entwicklung
Economy/economical – Wirtschaft/Ökonomie
Elite – Elite
Enclosure/fortified/fortification – Befestigung/Kreisgraben
Environment/ecology – Umwelt/Ökologie
Ethno – Ethno
Female/woman/women – Weiblich/Frau
Grave – Grab/Gräber
Human – Human/menschlich
Identity – Identität
Ideology – Ideologie
Inequality/equality – Ungleichheit/Gleichheit
Iron Age – Eisenzeit
Landscape – Landschaft
Local – Lokal
Male/maskulin/man, men – Männlich/Mann/Männer
Marx – Marx
Materiality/material culture/materialism/material concept – Materialität/Materielle Kultur
Megalithic – Megalithik
Mega-sites – Megastrukturen
Monumentality/monumental – Monumentalität/monumental
Neolithic – Neolitisch
Pollen – Pollen
Power – Macht
Production – Produktion
Ritual – Ritual/rituell
Settlement – Siedlung
Social – Sozial
Society – Gesellschaft/Gemeinschaft
Supra regional – Überregional
Transformation – Transformation
Warrior – Krieger

ERGEBNISSE

Eine erste Analyse ergab ein dichtes Cluster, bei dem die Begriffe ‚Marx' und ‚Mega-sites' weit nach außen streuten. Die Haupttrennung der Artikel erfolgt nach der jeweiligen zeitlichen Zuordnung zum Neolithikum und der Bronzezeit und ihnen zugeordneten Themenfeldern. ‚Marx' und Mega-sites' kommen nur in einem kleinen Teil der Artikel vor, werden dort aber überproportional häufig genannt. Daher wurden sie für eine zweite Analyse aus der Matrix entfernt (Abb. 1).

Die daraus resultierende Korrespondenzanalyse mit den ersten beiden Eigenvektoren lässt sich in neun Cluster untergliedern, deren Begriffstypen bestimmte Themenbereiche widerspiegeln und für die Reihung der Artikel in diesem Band genutzt wird. Die Korrespondenzanalyse trennt entlang der Y-Achse weitgehend Artikel mit naturwissenschaftlicher Ausrichtung (im y negativen Bereich) von mehr theoretischen, gesellschaftlichen und soziale Belange ansprechenden Texten (im y positiven Bereich). Auf der X-Achse trennen sich vor allem Artikel die auf Individuen und Gräber eingehen (im x positiven Bereich) von Texten mit Siedlungs- und Umweltaspekten und den großen

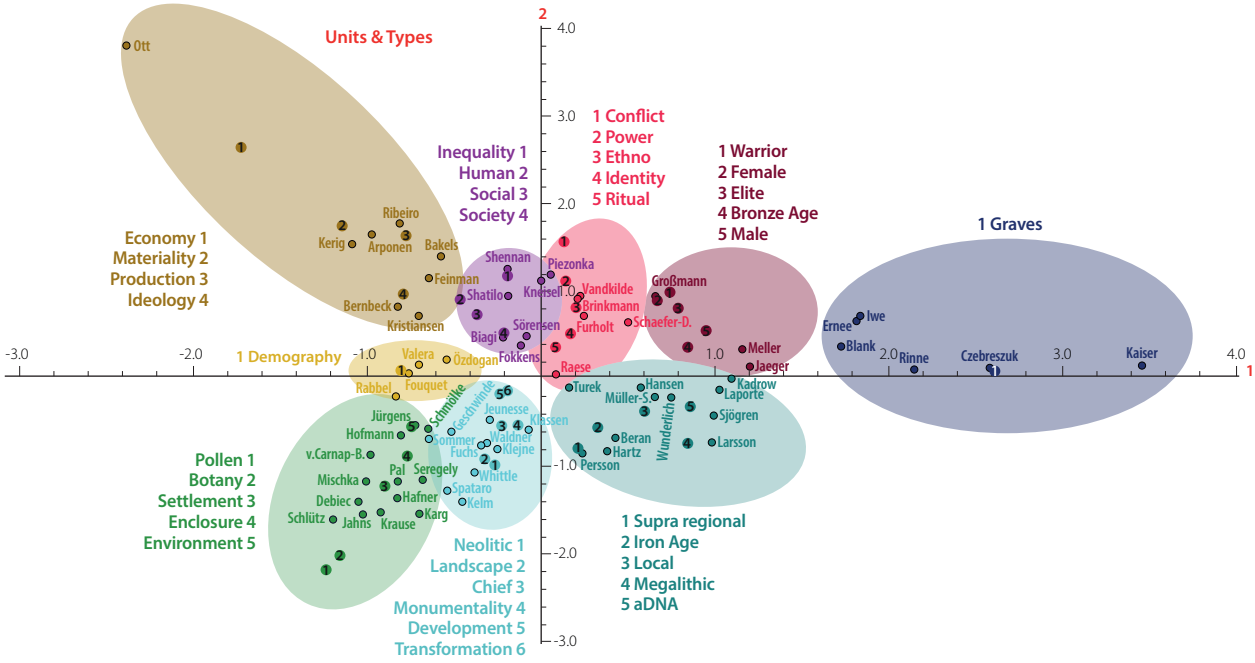

Abb. 1. Korrespondenzanalyse der am häufigsten benutzten Begriffe in diesem Band nach Autor:innen; 1. gegen 2. Eigenvektor.

Gesellschaftlichen Fragestellungen (im x negativen Bereich). Die neun Gruppen lassen sich wie folgt klassifizieren:

1. **The production of values**: Economy – Materiality – Production – Ideology

   Hier liegen wir, wie unschwer zu erkennen ist, im Bereich der marxistischen Archäologie, denn für Karl Marx war die Frage, wie Werte im kapitalistischen Produktionssystem entstehen und wie sie angesprochen werden eine der ganz zentralen (Marx 1867), die konstitutiv für unser — damit sind auch wir Forschende gemeint — kapitalistisches Denken ist.

2. **The organisation of societies**: Inequality – Human – Social – Society

   Im Zentrum der Gruppe steht die Frage nach der Entstehung und Entwicklung sozialer Ungleichheit und stratifizierter Gesellschaftsstrukturen. Ein Thema, das einen gewichtigen Platz in der Forschung von Johannes Müller einnimmt und nicht zuletzt 14 Jahre Forschung im Subcluster *„Inequality"* des Excellenzclusters ROOTS (2019 bis 2032) ermöglicht.

3. **Perspectives on power**: Conflict – Power – Ethno – Identity – Ritual

   Machtstrukturen setzen ein Verständnis von Kollektivität und Identität voraus und sind im archäologischen Fundgut häufig auch im rituellen Bereich zu erkennen. Die Definition und die Überschneidung solcher kollektiven Identitäten birgt immer auch Konfliktpotential, so wie wir es auch heute in unserer Gesellschaft wahrnehmen, denken wir an die Genderdebatte, Rassismus und Nationalismus.

4. **Construction of social roles**: Warrior – Female – Elite – Bronze Age – Male

   Hier dreht sich alles um, Männlichkeit und Krieger, traditionell ein Mythos der Bronzezeitforschung, in dem offensichtlich auch eine Menge Projektion und Wunschdenken sichtbar wird. Interessant ist, dass tatsächlich die Begriffe ‚Frau' und ‚weiblich' in den Artikeln wesentlich häufiger auftauchen als ‚Mann' und ‚männlich', jedoch scheint der männliche Krieger weiterhin das beherrschende Thema der Bronzezeit-Archäologie zu sein.

5. **The social significance of burials**: Graves

   Im Gegensatz zur Siedlungsarchäologie lässt sich mit der Untersuchung von Gräbern wesentlich direkter auf prähistorische Personen und ihre individuellen Eigenschaften schließen — falls das Individuum denn in der Vergangenheit auch als

solches wahrgenommen wurde. Immerhin ist es ja ein modernes Konzept, das vom egozentrischen, profitmaximierenden Zeitgeist geprägt ist. Auch wenn wir Archäolog:innen die Uniformität in der Klassifizierung suchen, überrascht jeder neue Befund und stellt vorangegangene Annahmen in Frage.

6. **Bridging the scales**: Supra regional – Iron Age – Local – Megalithic – aDNA

   In diesem Abschnitt ist der weite Blick auf das Fundmaterial sowohl zeitlich als auch räumlich verortet. Spätestens seit seiner Kölner Zeit hat Johannes Müller in seiner Arbeit immer den Skalenvergleich propagiert, sei er räumlich, zeitlich oder sozial zu verstehen. So reichen die hier gruppierten Beiträge auch von neolithischen Megalithanlagen bis in die Eisenzeit und beziehen lokale bis überregionale Perspektiven wie auch moderne Analysemethoden wie die aDNA mit ein.

7. **Johannes' favourites**: Neolithic – Landscape – Chief – Monumentality – Development – Transformation

   Hier sind die großen Fragen verortet, die auch Johannes Müller beschäftigen. Die Entwicklung vergangener Gesellschaften, Transformationsprozesse und das von allen Zeiten bevorzugte Neolithikum mit seinen ‚Chiefs' und der Landschaftsarchäologie. Schlüsselwörter, die sich in den großen Forschungsprojekten wiederfinden, vom SPP 1400 „Frühe Monumentalität" über die Graduiertenschule „Human development in landscapes" bis hin zum SFB 1266 „Scales of Transformation" und dem Exzellenzcluster ROOTS.

8. **Counting people**: Demography

   Demografische Entwicklungen zwischen Neolithikum und dem Zensus in der frühen Neuzeit verortet, beschreiben die Gruppengrößen, und damit auch die soziale Struktur in den Siedlungen und Städten. Ein weiteres Steckenpferd von Johannes Müller, dem mit elaborierter Statistik zu Leibe gerückt wird.

9. **Environment matters**: Pollen – Botany – Settlement – Enclosure – Environment

   Eine Stärke in Kiel ist die interdisziplinäre Zusammenarbeit im eigenen Institut. Die Umweltwissenschaften und die Archäobotanik waren schon immer stark in Kiel und sind in den letzten Jahren um ein Vielfaches gewachsen. Die Selbstverständlichkeit, mit der botanische Analysen mit archäologischen Befunden verknüpft werden, spiegelt sich in dieser Gruppe wieder.

Ein Vergleich der Begriffe mit denen aus den Titeln von Johannes Müller Literaturverzeichnis (Abb. 2) zeigt eine deutliche Übereinstimmung in den Tendenzen ihrer Verwendungs-Häufigkeiten. Die Artikel dieser Festschrift sind somit eine gelungene Reminiszenz an das langjährige Schaffen und Wirken von Johannes Müller.

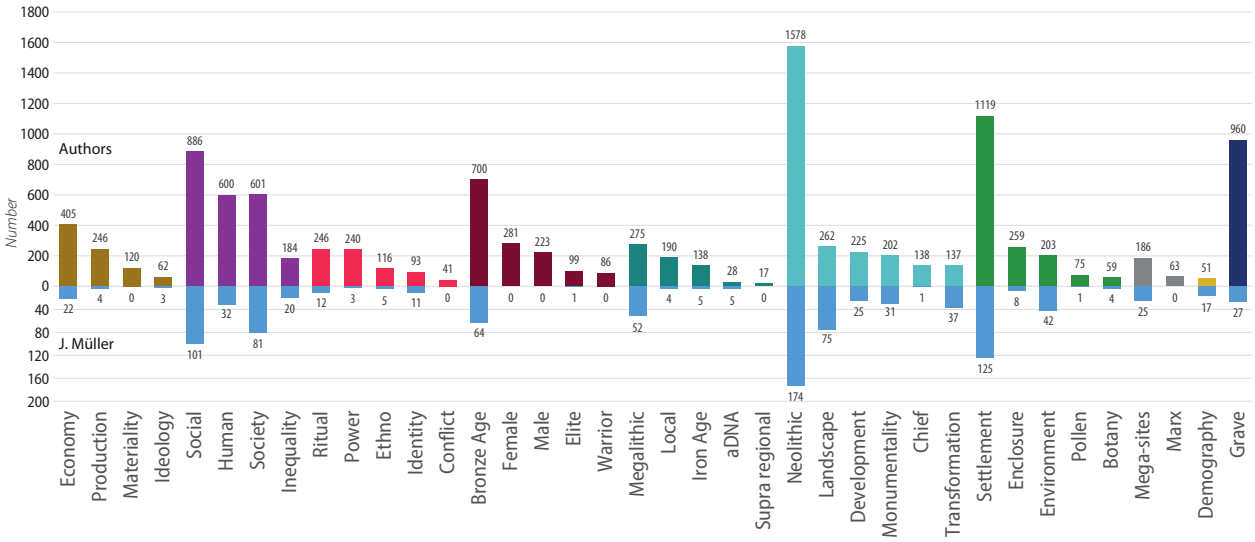

Abb. 2. Ein Vergleich der abgefragten Begriffe zwischen den Beiträgen in diesem Band und den Titeln der Literaturliste von Johannes Müller.

DISKUSSION

Die folgende Diskussion mit den Begriffstypen bezieht sich weniger auf die im vorliegenden Band versammelten Beiträge, die die Leserinnen und Leser selbst erforschen dürfen, sondern — wie es sich für eine Einleitung zu einer Festschrift gehört — auf die Person und das Wirken von Johannes Müller.

Economy: Der im Grunde geizige Nordhesse, „geiziger als ein Schotte" (freundl. Mitt. Johannes Müller), organisiert zielgerichtet Gelder, um aktuelle Forschungen voranzutreiben, und das in einem Fach, das nur immaterielle Werte schafft.

Die **Production** schlägt sich vor allem in den Publikationen nieder. Mit 50 Büchern und knapp 400 Artikeln (siehe Literaturliste) ist es kaum möglich, alle gelesen zu haben. Publizieren ist auch stets ein drängendes Thema in Gesprächen mit Angestellten und Mitarbeiter:innen. Denn Publikationen sind das Kapital der Wissenschaftler, um bei Marx zu bleiben.

Materiality: Funde spielen eine große Rolle im Leben von Johannes Müller, sei es der lang gesuchte blaue Glasring, der Remedello-Dolch, der noch schnell einen Artikel braucht, der goldene Dolch aus Polen, der zufällig in der Eremitage gezeichnet wurde, bevor der Krieg ausbrach, eine neue Kugelamphore oder die Funde aus Kindheitstagen, die auf Mutters Dachboden lagerten. Funde von zahlreichen Grabungen, die noch mal eben schnell zur Analyse müssen.

Ideology: Damit hat er eigentlich gar nichts am Hut (siehe Abb. 2).

Social and Human: Ohne Menschen geht es nun mal nicht in der Archäologie, und bei all den Funden und Befunden, die wir Archäolog:innen im Laufe eines Arbeitslebens ausgraben, geht es bei Johannes Müller immer um die gesamtgesellschaftliche (Society) Entwicklung. Seine Mitgliedschaften in den verschiedenen Vorständen und Beiräten sowie als Herausgeber zeigen seine aktive Teilnahme und Einflussnahme auf die Richtung, die die archäologische Forschung in den vergangenen Jahren genommen hat. Aus den Projekten haben sich auch über die Jahre enge Freundschaften entwickelt unter anderem zu Janusz Czebreszuk und Marzena Szmyt aus Poznań, die in gemeinsamen Reisen und Unternehmungen auch außerhalb des Universitätsbetriebes mündeten und münden werden. Und da heißt es, ein Professor habe kein Sozialleben.

Ein wesentliches Anliegen seiner gesamten Laufbahn, aber auch verstärkt der letzten Jahre, ist ihm das Thema **Inequality**, nun einer von sechs Themenschwerpunkten im ROOTS Exellenzcluster, den er mit großer Energie vorangetrieben hat und das er als politisch denkender Mensch als eines der großen Probleme unserer heutigen globalen Gesellschaft ansieht.

Ritual: Auf Grabungen entwickeln sich so einige Rituale und als Grabungsleiter:in lernt man genug Studentenfutter auch für den Chef mit einzupacken oder mehr Tee/Kaffee zu kochen. Bekannte Rituale sind die morgendliche Kaffeepause im Zimmer seiner Mit-arbeiter:innen (mit der besseren Kaffeeauswahl) und intensive Gespräche nicht nur zum Neolithikum oder die früher noch erlaubte Zigarette bei den Botaniker:innen.

Power: Machtstrukturen sind ihm zuwider, das zeigt sich im saloppen Umgang mit den Mitarbeiter:innen oder der betont legeren Kleidung. Natürlich auch irgendwie ein Paradox, da er mindestens seit seiner Kieler Zeit ja selbst viel Macht über andere ausübt. Aber Vorsicht, wenn er den Anzug anlegt, dann kann ein ernstes Gespräch anstehen.

Ethno: Seine Liebe zur Ethnologie hat er sich seit seiner Studienzeit stets bewahrt. Ethnografische Studien in Äthiopien, Indonesien oder Indien wirken wie eine Verjüngungskur, von deren Reisen er aufgeregt und motiviert mit vielen neuen Ideen zurückkommt. Da ist es nur konsequent, dass er in Kiel erst jüngst eine Professur für Ethnoarchäologie geschaffen hat.

Identity: Ganz klar Hesse und zwar Nordhesse. Auch wenn er schon viele Jahre in Kiel wohnt. Würden wir Archäologen:innen sein Hausinventar analysieren, sähe es ganz anders aus. Wir sehen hier eine Person mit starker Mobilität weiträumigen Netzwerken, die vor allem nach Indien weisen.

Conflict: Gibt es viele und als eingefleischter Pazifist geht er diesen gerne aus dem Wege. Es sei denn es wird politisch. Da bezieht er sofort und gerne Stellung, sei es bei den Themen Flucht und Asyl, Polizeieinsätzen gegen Anti-AKW-Aktivisten, seine Zusammenarbeit mit ukrainischen Kolleg:innen vor und während des russischen Angriffskrieges oder gegen die Pläne der Universität mehr in Militärforschung zu investieren. Auch seine Vorlesungen und Vorträge beginnen gerne mit einem aktuellen politischen Statement.

Bronze Age: Wenn es sein muss, darf es auch Bronzezeit sein, aber dann bitte nur Frühbronzezeit, von vereinzelten Ausflügen in die Mittelbronzezeit (^{14}C-Daten;

Kakusz-Projekt) abgesehen. Dass sein langjähriges Forschungsprojekt Bruszczewo sich als rein bronzezeitlicher Fundplatz herausstellen würde, war so nicht geplant. Aber es fanden sich einfach keine brauchbaren neolithischen Scherben. Immerhin beginnt das benachbarte Grabhügelfeld von Łęki Małe mit einer schnurkeramischen Bestattung, ein kleiner Trost.

Female or **Male** spielt bei ihm keine große Rolle, weder in der Vergangenheit, wo ihn die Menschen an sich interessieren, noch in der modernen Arbeitswelt. Es geht um Inhalte, Forschungsergebnisse und Publikationen, das Genderzeichen dahinter ist unwichtig. Die „alten weißen Männer" Netzwerke, die die DFG mit ihren Richtlinien zur Geschlechtergleichheit aufbrechen möchte, haben bei ihm nie wirklich existiert. Für manche Studierende ein ungewohntes Bild, wenn sie nach Kiel wechseln.

Eliten sind ihm ein Gräuel. Das Gerücht, das jahrelang unter den Studierenden kursierte, er sei früher Punk gewesen, musste er jedoch leider verneinen.

Warrior: Johannes Müller war ein überzeugter Kriegsdienstverweigerer, hat sich in den 1980er Jahren in der Friedensbewegung engagiert und sich seine pazifistische Überzeugung auch im Zuge der medial verkündeten „Zeitenwende" erhalten. Im Angesicht des Ukrainekriegs hat er stattdessen seine Unterstützung für die ukrainischen Kolleg:innen mit erheblichem persönlichem Einsatz unter Beweis gestellt. Fachlich hat er sich nie besonders für das Konzept von Kriegern oder Kriegereliten interessiert, dafür umso mehr für Rebellion und Widerstand „von unten".

Megalithic: Seine große Liebe. Der einzige Disney-Film, den Johannes Müller kennt ist Shrek 2. Der Grund: Sie küssen sich in einem Megalithgrab![1] Die Megalithen sind sein großes Thema. Ob die Großsteingräber in der Altmark, die Anlagen auf den Orkney-Inseln, die Bauten in der Bretagne oder auf Malta, sie alle kennt er mehr oder weniger persönlich, wir uns mal sagte. Folgerichtig zogen ihn seine ethnografischen Studien im Schwerpunktprogramm „Frühe Monumentalität und soziale Differenzierung" auch nach Indien zu den rezenten Megalithen und deren Erforschung. Einen Projektantrag, den er mal eines Sonntagnachmittags aus dem Hut „zauberte" und der zu seiner großen Überraschung sofort durchgewinkt wurde.

Ins **Local** geht er gerne, auch wenn es in den letzten Jahren nachgelassen hat. Archäologischer Alltag dominiert die Tischgespräche oder auch mal Fußball. Bei der Wahl der Speisen bestellt er einfach das Gleiche wie sein Gegenüber. Das ist Arbeitseffizienz.

Iron Age, auch das kann er bedienen, denn als Professor bewegt man sich in allen Zeiten auf sicherem Parkett. Nun, zumindest meistens. Über die Hallstattzeit können wir ja nochmal diskutieren. Aber immerhin weist seine Publikationsliste fünf Titel zur Eisenzeit auf.

aDNA: Johannes Müller hat sich sehr früh kritisch mit den neuen (alten) Deutungsmustern, die im Zuge der aDNA Revolution vor 10–15 Jahren popularisiert wurden auseinandergesetzt. Einige der aDNA-generierten Narrative, die Johannes Müller im Gegensatz zu anderen sehr positiv gegenüberstand, waren dann leider nur kurzlebig, wie der Nachweis von vermeintlicher Polyandrie in den frühbronzezeitlichen Gräben von Łęki Małe. Beim Thema aDNA demonstrierte Johannes Müller wieder einmal wie schnell er neue Verfahren aufgreift und Institutionen schafft, um diese neuen Technologien auch in Kiel zur Verfügung zu haben. Dazu gehört die zweite Professur, die in Kiel neu geschaffen wurde …

Supra: „Super…" ist die standardisierte Motivationsanwort in E-Mails und im Gespräch. Ein spontaner Endomorphinausbruch signalisiert dem Gegenüber zuverlässig: richtig so und weiter so! Und wie das in kleinen sozialen Gruppen nun einmal so ist, wurde dieser positive Zuruf nach und nach von den Mitarbeiter:innen übernommen.

Neolithic rules Kiel. Die Welt des Neolithikums ist immer wieder faszinierend und die Möglichkeiten sie zu betrachten unzählig. Immer neue Analysemöglichkeiten liefern spannende Ergebnisse und nach 20 Jahren Zusammenarbeit hat man sich auch als Bronzezeitlerin (JK) mit der Ästhetik der neolithischen Keramik angefreundet. In Kiel um das Neolithikum herumzukommen ist nahezu unmöglich. Jeder Studierende kann Trichterbecher, Schnurkeramik oder eine A-Axt bestimmen. Aber der Kessel von Gundestrup oder die Urne von Gevelinghausen? — noch nie gehört. Wie heißt es so schön, man kann nicht alles lernen.

1 Das stimmt nicht ganz. Shrek schließt sie über Nacht zur Sicherheit im Megalithgrab ein. Doch geben wir uns hier gerne mit der romantischeren Sichtweise zufrieden.

Landscape war nicht nur bei der Graduiertenschule „Human development in Landscapes" ein Thema. Wandern und Reisen sind Johannes Müller zweite Leidenschaft und das nicht erst seit dem Reisestipendium des DAI. Zwar ist das Ziel oft ein megalithisches, aber auch die Mittelgebirge, Alpen oder Indien haben es ihm angetan.

Development: Wie kein zweiter hat Johannes Müller die Weiterentwicklung der Forschung zum Neolithikum und der frühen Bronzezeit vorangetrieben. Stets ist er neuen Entwicklungen und Technologien gegenüber aufgeschlossen und will sie gleich ausprobieren. Geld dafür ist immer da. Vor allem mit Projekten, Doktoranden und der Nutzung neuester Forschungsmethoden — Stichwort: Integrative Archäologie, wie es Johanna Brinkmann, eine seiner Schülerinnen, geprägt hat. Die Absolventenliste ist lang, der Zuwachs an Professor:innen beträgt in seiner Zeit mehr als 200 % und die Zahl der Mitarbeiter ist seit seinen Anfangsjahren in Kiel von 19 auf momentan 113 gestiegen.

Monumentality: Bei dieser Entwicklung ist es nicht verwunderlich das in Kiel in allen Bereichen Monumentalität gelebt wird. So auch im Jahre 2015, als zum 350. Jubiläum der Universitätsgründung ein Megalithgrab auf dem Campus errichtet wurde. Was aus einer Weinlaune heraus entstand, wurde im Mai 2015 umgesetzt. Rund 60 interessierte Bürger:innen, Studierende und Lehrende zogen sprichwörtlich an einem Strang, um Großes zu bewegen und bleibende Spuren auf dem Campus zu hinterlassen.

Chief: Nun, wer wenn nicht er, ist der „Chef vom Janzen". Die Projekte, die er in den letzten Jahren auf den Weg brachte und die doppelte Sprechertätigkeit sowohl beim SFB 1266 als auch bei ROOTS weisen ihn als „Big man" aus. Dabei muss er nicht im Langhaus sitzen, ein langer Flur tut es auch. Der Blick auf die Straße behält das studentische Treiben im Blick und der Umwelt wird mit spärlichen Grünpflanzen (Lebensdauer immerhin ein paar Jahre) auf der Fensterbank Tribut gezollt.

Transformation ist das große Thema des Sonderforschungsbereiches 1266 gewesen und ein Wandel wird sich auch nach der Pensionierung von Johannes Müller am Kieler Institut abzeichnen. Aber — und das haben wir im SFB 1266 gelernt — Wandel ist eine notwendige Voraussetzung für Gesellschaften, um zu bestehen. Stillstand bedeutet das Ende. Und so hoffen wir, dass der bevorstehende „Trigger": Pensionierung zu einer erfolgreichen Transformation am Institut für Ur- und Frühgeschichte der Universität Kiel in Zukunft führen wird.

Megasites: Da kann es nur eine geben — Kiel. Nach den Messungen von Johannes Müller liegt Kiel in der geographischen Mitte von Europa. Wenn das nicht ein eindeutiger Wink mit dem Zaunpfahl ist.

Marx: spricht für sich selbst — oder?

Grave: Mit Gräbern fing Johannes Müller Karriere an — und, für alle die es ganz genau nehmen, als „Raubgräber". Als Schüler untersuchte er mit seinem selbst gegründeten „Verband Jugendlicher Archäologie" die Umgebung seines Heimatdorfes. Zum Glück unterband das Museum Kassel diese Aktivitäten nicht, sondern integrierte die jungen Forscher in die Aktivitäten des Museums. Eine Arbeit für die Zeit „danach" ist, das Glockenbechergräberfeld, dass noch in einem Keller lagert.

Settlement: Nach langen Jahren des Herumstreifens an den Universitäten in Freiburg, Edinburgh, Berlin, Bamberg und einem kurzen Zwischenspiel in Köln, ist er in Kiel sesshaft geworden.

Enclosures/Fortification: Im Gegensatz zum eigentlichen Zweck von Befestigungsanlagen steht Johannes Müllers Tür immer offen und spontane Fragen oder kurze Absprachen waren und sind immer möglich. Ebenso offen ist sein Zuhause für Gäste aus dem In- und Ausland, gerne auch mal länger. Abends beim Essen werden dann mal eben neue Projekte auf den Weg gebracht.

Environment spielt in Kiel schon immer eine wichtige Rolle und der Ausbau der Archäobotanik mit erst einer Juniorprofessur und dann einer W2 Professur wurden von Johannes Müller als erste in einer Reihe neuer Professuren am Institut durchgesetzt. So wichtig ihm die Mensch-Umwelt-Beziehung im Neolithikum ist, so hilflos steht er der „grünen Hölle" in seinem Garten gegenüber. Bei langen, nächtlichen Autofahrten nach Poznań konnte man stundenlang über das Entfernen von Löwenzahn und den Löwenzahnstecher diskutierten. Auch scheint das Rasenmähen in seinem Leben eine besondere Bedeutung einzunehmen.

Pollen: Mit dem Pollenanalytiker Walter Dörfler verbindet Johannes Müller eine enge Freundschaft, die zu gemeinsamen Reisen nach Japan führte und wohl auch in Zukunft führen wird. Gemeinsame Forschungsfragen und einen Transekt von Schleswig-Holstein bis nach Polen erlauben die Umweltrekonstruktion der einzelnen Regionen, die sich gleichzeitig in den Projektschwerpunkten und Grabungen in diesen Regionen widerspiegeln.

Botany: Helmut Kroll war jahrzehntelang die botanische Koryphäe in Kiel. In seinem Abschiedsbrief erzählte er von seinen vier großen Projekten, die ihn am Ende seines Lebens mit Stolz erfüllten. Dazu gehörten auch die beiden Projekte von Johannes Müller: Okolište und Bruszczewo.

Demography: ist ein relativ neues Steckenpferd, dem er mit vereinten Kräften von Postdocs und Doktorand:innen nachgeht. Diese von manchen nur als statistische Spielereien bezeichneten Analysen bilden Zahlen und Tabellen grafisch ab und ermöglichen die Darstellung diachroner Narrative im Vergleich mit anderen Proxies wie Ungleichheit, Gewalt oder Transformation. Forschungen, die erst jetzt durch die Vielzahl der vorhandenen Daten, darunter ^{14}C-Daten ermöglicht werden.

Mit diesem eher anekdotisch gestalteten Überblick wollen wir das Vorwort beenden und zum wissenschaftlichen Ernst, den Beiträgen in dieser Festschrift überleiten. Doch lesen Sie selbst. Die Themen sind nach Gruppen (Abb. 1) geordnet, deren Begriffe und Thematik gut mit Johannes Müllers publikatorischer Tätigkeit übereinstimmen (Abb. 2). Mit diesen vorliegenden zwei Bänden wird Johannes Müllers großer Leidenschaft — dem Neolithikum und der Megalithik — Tribut gezollt. Aber auch Liebhaber der Bronzezeit kommen auf ihre Kosten und selbst die Eisenzeit ist vertreten.

DANKSAGUNG

An dieser Stelle sei ein ausführlicher Dank an alle Personen gerichtet, die diese Festschrift erst möglich gemacht haben.
Ein besonderer Dank gilt allen Rezent:innen für ihre schnellen Reviews, den Studierenden, Lena Bandasch, Frederik Bantin, Konrad Hahn, Helena Killing, Hanna Mändl, Christina Moor, Erik Riese, Josina Sieler, Maike Schildbach und Marc-André Werner für die Korrekturen der Literaturlisten, Sara Jagiolla für die Zusammenstellung der Fotoseiten, Susanne Beyer für die Lebensbilder zu den Kapitelüberschriften, Petra Horstmann für die Gestaltung der Kapitelzwischenblätter, Carsten Reckweg für die Grabungsübersicht, Agnes Heitmann für die Unterstützung beim Layout, Janine Cordts für den Entwurf des Einbands, Eileen Kücükkaraca für die Korrektur der englischen Titel und Zusammenfassungen und vor allem Karin Winter für die Bearbeitung sämtlicher Grafiken, die Gestaltung des Layouts und die technische Redaktion.
Ein Dank geht an Barbara Fritsch, die uns mit Informationen aus der Zeit vor Kiel versorgt hat.
Gedankt sei unseren Mitherausgebern für die Zusammenstellung der Listen und Entscheidungshilfen.
Und herzlichen Dank an alle Autorinnen und Autoren für Ihre interessanten Beiträge, die diese Festschrift erst zu einem „schwer wiegenden" Werk gemacht haben.

LITERATUR

Marx, K., 1867. Das Kapital. Kritik der politischen Oekonomie. Hamburg: Otto Meissner Verlag.

CHAPTER 1

The Production of Values

Figure chapter 1: Reconstruction of the use of a cattle-drawn ard as it was regularly used from around 3300 BCE (Drawing: Susanne Beyer; graphic: Petra Horstmann).

The Post-material Turn in Archaeology of Inequality
A Reflective Concept of the Longue durée

V. P. J. Arponen

KEYWORDS: *inequality, post-material,value, prestige, cultural evolution, capability approach*

Abstract

This paper argues that the archaeology of inequality is moving from a material towards a certain *post-material* concept of value. As discussed by some in political science and economics, archaeology as well as society more broadly may be moving from *material and economic wealth based* thinking towards understanding different forms of what we may term *post-material value*. This article reviews some of the facets of the material and the post-material value paradigm.

Zusammenfassung

In diesem Beitrag wird argumentiert, dass sich die Archäologie der Ungleichheit von einem materiellen hin zu einem bestimmten postmateriellen Wertbegriff wandelt. Wie in den Politik- und Wirtschaftswissenschaften diskutiert, bewegt sich die Archäologie wie auch die Gesellschaft im weiteren Sinne möglicherweise von einem auf materiellem und wirtschaftlichem Reichtum basierenden Denken hin zum Verständnis verschiedener Formen dessen, was wir als postmateriellen Wert bezeichnen könnten. Dieser Artikel gibt einen Überblick über einige Facetten des materiellen und des postmateriellen Werteparadigmas.

INTRODUCTION

This paper argues that the archaeology of inequality is moving from a material towards a certain *post-material* concept of value. This shift means, as some in political science (Inglehart and Norris 2017) and in economics (Nussbaum and Sen 1993) note, that archaeology as well as society more broadly may be moving from *material and economic wealth-based* thinking towards understanding different forms of what we may term *post-material value*.

On the one hand, this shift poses a challenge to archaeology as a static, material culture focused science often with a corresponding material concept of value. On the other hand, exciting vistas of theory and method development lie ahead of us to capture the various dynamics and post-material facets of value. It can be anticipated that such a shift will be gradually cause a rethinking of the message from archaeology that provides a long-term window into the human past, which may already be underway (Graeber and Wengrow 2021).

It is commonly stated that archaeology has a *"unique access to millennia of human history"* (Beck and Quinn 2023, 2); that it can uniquely provide a *longue durée perspective* to past-present connectivities (Müller 2022; 2018; Ames 1991). That archaeology uniquely looks at the *long-term* trajectories of human development can hardly be disputed, but the nature of the interpretations that flow from this perspective cannot automatically thought to be somehow *"virtuous"* and beyond critique just because they in some sense build up on a long-term perspective.

While not synonymous with the idea of the *longue durée* (as discussed by the father of the phrase Fernand Braudel [1958] — more of which below), archaeology arguably benefits from, if not sometimes maybe even champions the persistent idea that there are *original and purer forms* of phenomena to be found in the distant past of prehistory. The most famous proponent of such an original *"natural state"* was, of course, the 17th century philosopher Thomas Hobbes. Such views

were later criticised, among others, by Michel Foucault in the idea that there are some essences that are *"without history"* (Foucault 1980, 139), or that if we trace back to their origins, then we can identify these phenomena in their purest, not yet adulterated forms. This is how, for example, Émile Durkheim framed his investigation into the elementary forms of religion, namely, as an investigation into the earliest forms, without predecessors, and present in societies of the *"simplest forms"* (Durkheim 1995). The same idea is arguably present in contemporary studies of primate life taken to represent simpler — again, supposedly unadulterated — forms of the same basic tendencies that humans might display in more complex settings (Jaeggi *et al.* 2010). As Michael Tomasello, the American behavioural scientist put it in a recent book:

"comparative studies of human children and their nearest primate relatives, especially chimpanzees [...] in these somewhat simpler cases we may see things more clearly than is possible in the myriad complexities of adult human behavior and societies."

(Tomasello 2009, XVII)

We also witness this line of thinking in the archaeology of inequality as a story from the unadulterated egalitarian beginnings to a more recent past and present polluted by inequality. That is to say, the basic longue durée view in archaeology of the emergence of wide-spread inequality has it, as neatly summarised by Rahul Oka and colleagues (Oka *et al.* 2018, 67), that *"human societies transformed from small mobile groups to settled communities with gradually increasing population levels and social complexity"*, a trajectory that inevitably brought *"institutionalization of social inequality"* with it. This is a narrative of the *"creation of inequality"* (Flannery and Marcus 2012) that is highly visible, among others, in the main trajectories of the European Neolithic and the Bronze Age typically conceived as the era in which institutionalised inequality took off powered by demographic, technological, and economic changes (Arponen and Ohlrau 2023).

Given the above, it is something of a puzzle that begs for an explanation that, while the mentioned kind of narratives flourish in archaeology and beyond, many are also increasingly critical of the entire explanatory edifice (Graeber and Wengrow 2021) or some of the more particular aspects of it such as its certain violence and inequality fetishism (Furholt 2021; Arponen and Brinkmann 2025) or the supposed simplicity of pre-agricultural forms of life (Arnold *et al.* 2016). Therefore, the ultimate value of the *longue durée* perspective as understood in archaeology must itself be critically appraised.

The notion of the *longue durée* derives, of course, chiefly from the late 1950s essay by the French historian Fernand Braudel (Braudel 1958; Braudel and Wallerstein 2009). Actually, if we go to Braudel's original essay, it is something of a reflective and a critical attempt itself at mapping certain dominant paradigms in the social sciences of Braudel's time and suggesting the *longue durée* as an alternative or at least a contrasting position.

In the article, Fernand Braudel is preoccupied with a number of contrasts and contrasting paradigms about history as a discipline. There is one that he describes as focused on *singular and instantaneous events* — history *"oriented to brief time spans, to the individual, to the event"* (*ibid.*, 173) — and he gives political history as a paradigm example. There is another paradigm that understands history as structured around *cyclical* phases, where Braudel's contemporary social and economic history are given as examples. In Fernand Braudel's article, there is the distinction between the *particularity* of the history of events — *"the rich reality of the episodic"* — and the *"too* longue durée*"* that seeks to identify *eternal forms* of human development. For Fernand Braudel, the *longue durée* perspective represents an alternative to, or at least a midway between, all of the above.

In a reflective contrast to the alternative positions that Fernand Braudel has sketched, he conceived of the *longue durée* in analogy to geographical constraints:

"man is prisoner for long centuries of climates, of vegetations, of animal populations, of types of crop, of slowly constructed equilibria"

(Braudel and Wallerstein 2009, 179)

which, for Fernand Braudel, give endurance to trade routes, settlement locations, and the persisting forms of human productive activity.

Alongside the *longue durée* of geography, there could be according to Fernand Braudel persistent *longue durée cultural perceptions*, systems of "attitude of *longue durée"*, as he writes. Understanding these would require getting to know *"slower temporalities, almost immobile ones"* that these attitudes constitute across generations, Fernand Braudel wrote. As an example, he argues that

"[e]ach of us has the sense that [...] there lies a massive historical past whose power and thrusts he recognizes better, it must be said, than its laws and direction".

(*ibid.*, 188)

At the same time, the *longue durée* should not however be taken to yield models *"frozen in their simple form [...] as immutable laws"*, as Fernand Braudel warns.

In all of the above, Fernand Braudel can be understood as engaged in a reflective analysis of paradigm positions in a *dialogical or dialectic* relationship with the state of the art in social sciences as he saw and conceived it in his time. He is calling for a re-evaluation in the sense of drawing a particular course across the landscape of sciences. Fernand Braudel appears as something of a paradigm pluralist where the methodologies of science call for a careful balancing of different paradigms than ideological commitment to some single paradigm.

In a parallel sense, the perspective that is proposed in the present paper is based on the idea that the *longue durée* as such, simply as a long-term developmental perspective to the roots of the present phenomena in the pre-historic past, *will not automatically* provide a perceptive angle to human development. This is because the underlying theory of value of such an undertaking may well be outdated based almost exclusively on material values — which arguably *is not* a *"21st century concept of progress"*, as the contemporary economic thinker Kate Raworth put it recently (Raworth 2017); it cannot be this because expansionism built into the economic concept of value is meeting its environmental limits. A new post-material concept of value is taking shape and can be anticipated to eventually arrive in society and archaeology alike at which point the *longue durée* perspective of archaeology, too, will in all likelihood be reassessed.

Following the modern classic philosopher of science Thomas Kuhn (Kuhn 1996; Lucas 2017), it can be argued that the *longue durée* will reflect the prevailing *paradigmatic* perspectives to given phenomena such as the nature and emergence of inequality. Therefore, a *reflective* identification and a *critical* examination of the dominant paradigmatic perspective or perspectives is in order. It will be argued that it is in the incorporation of certain entrenched paradigmatic conceptions of value that exerts one of the greatest impacts, not the *longue durée* perspective as such, upon the wider audience outside of archaeology.

In the sections that follow, the foundations of the creation story of inequality are first traced back to certain explanatory tropes about three major 'schools of thought': social evolution, Marxism, and culturalism. Then, an examination of an alternative, post-material perspective that has been emerging in archaeology is conducted.

SOCIAL EVOLUTION, MARXISM, AND CULTURALISM

The origin story of the emergence of inequality has its historical roots in the social evolutionary concept of human development. In this view, underneath it all, human development is driven by evolutionary processes of adaptation for the sake of survival and reproduction (Prentiss 2021; Prentiss *et al.* 2009). A classic and very persuasive articulation of this view might be found, *e.g.*, in Elman Service and Marshall Sahlins' book (Service and Sahlin 1960) but in many ways similar views are expressed today under the label of *behavioural ecology* (*e.g.* Ready and Holton Price 2021).

In these views, the methods and degrees of the adaptive process would be seen to involve stages of evolutionary sophistication (whether specific or general evolution [Service and Sahlins 1960]). Evolution would not only be conceived of as the process of technological advances for greater productivity but also socio-culturally as a process of the evolution of the tools of political management of increasing social complexity. In the classic expression of this extensive concept of human evolutionary adaptation, Lewis Binford argued that culture was

> *"the extra-somatic means of adaptation for the human organism [...] to its total environment both physical and social."* (Binford 1962, 218)

In this narrative, the gradual greater hierarchisation and centralisation of power, and with that inequality, appear as *"the organising principle"*, as the necessary evil developing with the demands of managing complexity (Price and Feinman 2010, 147). Not only does it appear here as a natural organising principle of human relations, but in fact the very marker of human *success and flourishing*:

> *"institutions [...] that integrated larger numbers of people into a cooperating unit [...] could be more successful in competition than groups not integrated in this way."* (Shennan 2008, 86)

Historically, the social evolutionary concept related to ideas about individualism, maximisation, and rational choice are summarised in the concept of the *homo economicus* (Persky 1995; Mele and González-Cantón 2014). In archaeology and anthropology, it has appeared to some that such

> *"aggrandizers are probably responsible for many of the fundamental transformations of culture that archaeology has been able to chronicle over the past 40,000 years."* (Hayden 2014, 17)

Systems theoretical approaches can be viewed as kindred to evolutionary approaches, especially given their shared root in biological systems theory and ecological cultural anthropology (Bernbeck 1997, Chapter 6). In contrast, systemic or structuralist thought, for example, in early anthropology, considered it im-portant to see systems and structures as, if you like, *emergent* phenomena reducible neither to biological nor cultural determinants (Durkheim 1984; 1982; Garlitz 2020; Warfield Rawls 2011; Meadwell 2023).

Alongside the social evolutionary thrust, a second arguably major line of human scientific thought emanates from Marxism and historical materialism. Central to Marxism is the idea of an inherent *class conflict* developing and changing shape as the historical modes of production evolve (Trigger 1993; Rosenswig and Cunningham 2019). In Marxism, the socio-economic world appears as essentially shaped by power relations. In classic, or if we like, in *naive* historical materialism, the base characterised by relations of material production was understood to determine political, ideological, and other such superstructural ideas.

Outside of archaeology, since prominent commentators such as Louis Althusser (1977), Marxism took a more culturalist turn allowing ideology, culture, and perceptions a greater independence from the socio-economic base (Wolff and Resnick 2006). These ideas formed the basis of the perspective of many modern classic Marx-inspired scholars, such as Michel Foucault, as to how power can mask itself and appear as the natural order by way of the *symbolic reproduction* in language and thought of certain social orders (Cisney and Morar 2015).

In archaeology, this can be seen to have precipitated a shift towards the concept of *prestige* and its accumulation as a marker of increasing social complexity visible in the early work of Kristian Kristiansen (1984) and carried forward in later work (Kristiansen and Earle 2010; see also Müller and Bernbeck 2016).

Early post-processual archaeology seized upon essentially parallel ideas bringing together the Marxist interest in power with the idea of the cultural domain as essentially shaping, even masking, the collective perception of power (Miller and Tilley 1984; Shanks and Tilley 1988). From Karl Marx and Friedrich Engels, we indeed know the concepts of religion as an *"opium of the masses"* and the concept of *"false consciousness"* as our collective ability to be deceived and to deceive ourselves as regards the nature and seat of power. Present in some of the archaeological interpretations of these themes is the idea that such leaders — if you like, *"strongmen"* (Rachman 2022) — operate and orchestrate complex, decentralised systems, not by virtue of institutional arrangements, shared values, collective commitments and such, but *"underwritten by personal bonds rather than written treaties and contracts"* (Kristiansen 2015, 9).

Alongside social evolution and Marxism, we can think of culturalism as forming a third major 'school of thought' about human social organisation. In the words of one of the most prominent philosophers of archaeology, Alison Wylie, culturalism is first and foremost characterised by the idea of the indeterminacy of socio-cultural forms by anything outside of the forms themselves, be it the environment, human nature, or socio-economic structures:

> *"cultural forms may be entirely idio-syncratic and may diverge radically from any we know or could recognize"* formed, as they are, in the context of one or another *"system of intentional, conventional action informed by shared cultur-al 'norms' or ideals."* (Wylie 1989, 1)

This is the same idea as in Clifford Geertz's often cited view of culture as *"webs of significance"* that we ourselves have spun (Geertz 1973). The anthropologist Adam Kuper summed up the view arguing that in the implied concept of

> *"[c]ulture is here essentially a matter of ideas and values, a collective cast of mind [which] has become common currency"* in human scientific theory beyond archaeology and anthropology (Kuper 2000, 227–8).

In this dimension, culturalism joins forces with many of the central tenets of Marxism, in particular the idea of the *symbolic reproduction* of social relations in and through language — with the added Marxist spice that this reproduction is supposedly under control of the elites. These ideas of power, its political economic foundations, and the processes of symbolic reproduction, social construction and performativity of gender differentiations would also underlie feminist and gender archaeology (Conkey and Gero 1997; Robb and Harris 2018).

The concept of the symbolic reproduction of society implicates a concept that does not hitherto appear to have been critically studied in archaeology or anthropology: that of *prestige*. That is to say, symbolic reproduction is thought to operate with the accumulation and use of prestige as its ultimate aim and engine. The substitution of material accumulation with the accumulation of prestige allowed social archaeology to avoid the classic criticism of Marxism as *"economically deterministic"* or otherwise undue prioritising of the economic base over the ideological and political superstructure, the former of which Marx classically saw as determining the latter. In European archaeology, this moment is visible in the early work of Kristian Kristiansen (1984) where the 'culturalisation' of naive

economist Marxism undertaken in philosophy, among others by Louis Althusser (first published in 1965 in French and 1969 in English), was carried out in archaeology (Althusser 1977). In archaeology, these ideas led to the incorporation of the concept of *ritual economy* — the idea that the control of ritual activity was associated with control of labour power and therefore of economic processes (Brozio *et al.* 2019) — that Kristian Kristiansen has continued to use and develop further (see *e.g.* Kristiansen and Earle 2010).

The substitution of material accumulation with that of prestige, however, arguably preserves the 'accumulationist' social logic and the overall *"transactional"* concept of human relations to nature and culture (Arponen 2022; see also Arponen and Brinkmann 2025). From the perspective of the interpretative and narrative logic, it makes little difference whether the 'currency' of these transformations is prestige or something more tangibly material. This may con-stitute the hard core and the real tragedy of the impact of the *"capitalist ideology"* in archaeology and beyond (Cunningham and Mac Eachern 2016), namely, that arguably even culturalism tends to conceive the human relationship to nature and culture in terms of *"transactional"* investment-return mechanisms. A real alternative 'currency' can, however, be found in post-material theory that we will consider shortly.

A CONVERGENCE

Of the three 'schools', culturalism is the only one that entirely eschews the possibility of a general theory of, well, anything, emphasising instead particularistic investigations into the historically idiosyncratic formation processes of forms of social organisation.

Still, culturalism, social evolutionism, and Marxism are able to find a number of central points of convergence (Table 1). This convergence found a recent expression as follows:

"Understanding where and when inequality becomes institutionalized — socially ordained through institutions such as cultural norms, political structures, and ideology — is key for understanding variability and change in human societies."

(Beck and Quinn 2023, 2)

In a kind of convergence of a number of 'schools', the above passage incorporates the culturalist interest in the role of collectively shared cultural norms to shape the human condition. It incorporates the Marxist idea of ideology as power to define these structures, norms, and institutions as a sort of a Foucaultian *"biopower"* to define normalcy and therefore exclude the abnormal (Foucault 1990; Cisney and Morar 2015). And it incorporates the classic social evolutionary interest in the variability and change as it derives from the interplay of supposedly evolutionary advantageous cultural, political, and economic technologies of survival and reproduction.

There paradigmatic convergent picture of the creation of inequality is therefore a multi-paradigmatic amalgam containing elements summarised in the following overview:

Table 1. The picture places material values at the centre of the imagery in a range of different senses.

	Elite control of violence	Elites control ideology	Elites control resources	Demographic expansion	Technological development	Prestige
Social Evolutionism	•	•	•	•	•	
Marxism	•	•	•		•	•
Culturalism		•				•

There is the classic sense of the (elite) control of resources and generally the material means of production as categories of material value. Success of human societies and groups is understood as accumulation and expansion in these material domains. An essential part of the social imagery is that of elite control of the means of violence.

Like the control of the means of violence, supporting material accumulation and expansion, there is the culturalist and Marxist idea that humans, elites in particular, also accumulate and expand in the dimension of prestige (Müller and Bernbeck 2016). Here, the accumulationist and transactional logic of the material values paradigm is preserved even if prestige — as a kind of 'immaterial' category — replaces that of material values in the theoretical scheme. This justifies the juxtaposition of even the Marxist and culturalist concepts of immaterial prestige as a value with the post-material concepts to be considered next.

TOWARDS A POST-MATERIAL TURN

If the foregoing characterises the material concept of value prevalent in archaeology and found in various forms in all major 'schools of thought', then what marks the post-material turn?

We may begin our considerations by borrowing some ideas from political science. The modern classic political scientist, the late Ronald Inglehart, proposed in the 1970s that a certain *"silent revolution"* had been sweeping across the US society but also more broadly in the developed world (Inglehart 2015). The silent revolution was essentially a shift in values, away from the post-war focus on material rebuilding and material values — a process that had advanced very well and brought about unprecedented levels of material well-being (DeLong 2022) — and towards post-material political and other preferences having to do with openness to new ideas, tolerance, self-expression, and the like. People were beginning to look for meaningful life, not in the trappings of material life, but in various non-material dimensions.

As a side note, more recently, Ronald Inglehart and Pippa Norris argued that developed societies are now going through a *"silent revolution in reverse"* as inequalities, inflation, the increase of living costs and such once again raise the spectre of existential insecurity for more and more people even in developed societies (Inglehart and Norris 2017; Inglehart 2018; Arponen 2018).

This post-material turn is now arguably working itself out in archaeology, but as always, a paradigm shift is painful, slow, incomplete, and always reversable.

The archaeological and anthropological critique of the idea that material values would prevail on the earth in all places and times is old. Bronislaw Malinowski stated that the idea of the rational and self-interested *"economic man"* must be *"exploded once and for all"* claiming that humans act, instead, from *"motives of a highly complex, social and traditional nature"* (Malinowski 1922). Again, Marshall Sahlins proposed that there was or had been *"original affluence"* that was essentially post-material in its character, while we the moderns sadly remained in the grips of the material concept of affluence (Sahlins 1972).

In philosophy and economics, the towering figure of Amartya Sen stands as arguably one of the most clear-headed critics of material value-based thinking about justice, inequality, and human development (Nussbaum and Sen 1993). The philosophical basis of Sen's so-called *capability approach* is as follows.

Drawing influence from Karl Marx and Aristotelian virtue ethical considerations (Sen 1992), as well as from Buddhist ideas from his native India (Sen 2014), Amartya Sen's philosophy is based on a contrast between values based on *havings* and values based on *doings and beings*. Sen argues that upon closer reflection, the various forms of *having* something, such as material wealth but also of prestige, must be considered to have the status of *means* to some quite different category of *ends*. The ends have to do with being able to *do and be* something in life — that is, it is a category focused on *leading active lives* as opposed to having *passive possession* of something. For example, the possession of money is not an end in itself, but an important means by which one can enable various activities. Amartya Sen argues that, in this sense, poverty is not simply a lack of possessions but more essentially it is a *capability deprivation*, an inability to do and be. In this sense, Amartya Sen's philosophical views are clearly post-material.

In archaeology, Amartya Sen's ideas have garnered some attention (Arponen *et al.* 2016; Müller *et al.* 2015; Smith 2019; Munson and Scholnick 2021; Arponen *et al.* 2024;) but generally are still *"in early stages of development"* (Kohler and Smith 2018). Some of the central ideas in this literature include the attempt to think from the static archaeological record of material culture and architecture to the kinds of activities, and therewith capabilities, that the record might imply. The core is post-materialistic in that the focus is on activities, or indeed activity deprivations, that the material record might imply.

A seemingly distinct line of post-material thought in archaeology leads to Samuel Bowles *et al.*'s multi-dimensional concept of material, embodied, and social wealth (Borgerhoff Mulder *et al.* 2009; Bowles *et al.* 2010). In this literature, the core post-material idea is that alongside material wealth, the category of embodied wealth is described that refers to skills and abilities of specific kinds of activities and social or relational wealth is noted that refers to community connections and positions of individuals and groups. From this literature, the line goes back to the physical anthropology of Hillard Kaplan and the so-called *life history* approach to evolution. This approach specifically highlights the evolutionary role of the social organisation of human activity, in particular the social character of the evolutionary advantage deriving from members enabling their own communities to act and flourish in a multitude of ways through mutual care (Gopnik 2016; Frankenhuis and Nettle 2020; Sear 2020). A life history approach often talks about the organisational requirements of the 'delayed returns' of specifically human forms of advanced, agriculture-based subsistence as well as the long period of human childhood and juvenile dependence on community training and support, including increasing returns as those community-supported individuals mature and begin to bring their physical and mental abilities to bear (Kaplan *et al.* 2000).

Elements of the post-material turn can be found elsewhere in anthropology and archaeology as well. For example, in the collective action approach developed in Richard Blanton and Lane Fargher (Blanton and Fargher 2008; 2016), the authors emphasise the human ability and need to bargain and strike compromises to generate forms of collective action. Gary Feinman and colleagues have made an extensive use of these ideas in archaeology (see *e.g.* Feinman and Carballo 2018). In separate developments, the concept of heterarchy (Crumley 1995; 2005; Thurston 2019; Ray and Fernández-Götz 2019) but also anarchism (Angelbeck and Grier 2012) arguably contain similar ideas that look at power and social organisation from the points of view of how they have an enabling, shared, collective, and organisational nature.

All these approaches can serve to philosophically foreground human activity, in particular collective activity, even if, *e.g.*, Richard Blanton and Lane Fargher do not seem to commit to any particular philosophical view of human post-material ends and material means as found, for example, in Amartya Sen. The true philosophical leap, achieved explicitly in Amartya Sen's idea that individual and collective *activity* and its *enablement* by individual and collective organisational means are the peculiarly human ends, remains foreshadowed but not explicitly developed. The other, classic option, namely that ultimately collective action represents bargaining contractualism by self-interested, *"boundedly rational"* individuals is arguably not conclusively rejected nor even identified as the root of our imagery of human sociality.

Mutual differences and ambiguity notwithstanding, all these approaches seem to share a common core in the post-material idea that humans care deeply about being capable of meaningful action and that the scope for such action is essentially generated in and through social, collective activity. That constitutes the core of what in this paper is thought of as the post-material turn.

CONCLUSION

Archaeology cannot hope to automatically and magically provide a unique and *"virtuous"* view of the human past, present, and future by simply viewing the human history in the *longue durée* perspective. The basic worry is that such a perspective may simply end up reproducing whatever paradigmatic conceptions of the fundamental drivers of the human-environment relationship currently dominate the agenda, however implausible they may be. A reflective investigation into the interpretative paradigms in archaeology in terms of which *longue durée* can be viewed is therefore necessary.

In this paper, a threefold mapping of archaeological 'schools of thought' or interpretative paradigms has been suggested. Furthermore, it was argued that each places a conception of *transactional material value* at the heart of its theorising about the human relations to nature and culture. In contrast to this, the emergence of a *post-material turn* in philosophy and in archaeological reasoning about value was suggested and its outline sketched.

REFERENCES

Althusser, L., 1977. *For Marx*. London. Verso.

Ames, K.M., 1991. The archaeology of the longue durée. Temporal and spatial scale in the evolution of social complexity on the southern northwest coast. *Antiquity* 65(249), 935–945.

Angelbeck, B. and Grier, C., 2012. Anarchism and the archaeology of anarchic societies. Resistance to centralization in the coast salish region of the pacific northwest coast. *Current anthropology* 53(5), 547–587.

Arnold, J.E., Sunell, S., Nigra, B.T., Bishop, K.J., Jones, T. and Bongers, J., 2016. Entrenched disbelief. Complex hunter-gatherers and the case for inclusive cultural evolutionary thinking. *Journal of archaeological method and theory* 32(2), 448–499.

Arponen, V.P.J., Müller, J., Hofmann, R., Furholt, M., Ribeiro, A., Horn, C. and Hinz, M., 2016. Using the Capability Approach to Conceptualise Inequality in Archaeology. The Case of the Late Neolithic Bosnian Site Okoliste *c.* 5200–4600 BCE. *Journal of archaeological method and theory* 23(2), 541–560.

Arponen, V.P.J., 2018. The roots of a crisis. Marx, Sen, and the capability deprivation of the left behind. *Philosophy of the social sciences* 48(3), 267–560.

Arponen, V.P.J., 2022. Depicting the human relationship to nature and culture. Transactionality and the homo economicus in game design. *Analog Game Studies* X(I).

Arponen, V.P.J. and Ohlrau, R., 2023. Archaeological interpretation and current events. Some reflections on the war in ukraine from the point of view of philosophy of archaeology and anthropology. *Forum Kritische Archäologie* 12, 92–105.

Arponen, V. and Brinkmann, J., 2025. Games and Gamification in Archaeology. Developing Analog Modeling as a Research Tool into Cultural Evolutionary Processes. *Archaeological Dialogues*. https://doi.org/10.1017/S1380203825000017

Beck, J. and Quinn, C.P., 2023. Balancing the scales. Archaeological approaches to social inequality. *World Archaeology* 54(4), 572–583. https://doi.org/10.1080/00438243.2023.2169341

Bernbeck R., 1997. *Theorien in der Archäologie*. Tübingen, Basel: A. Francke Verlag.

Binford, L., 1962. Archaeology as anthropology. *American Antiquity* 28(2), 217–225.

Blanton, R. and Fargher, F., 2008. *Collective Action in the Formation of Pre-Modern States*. New York: Springer Verlag.

Blanton R. and Fargher, L., 2016. *How humans cooperate. Confronting the challenges of collective action*. Boulder: University Press of Colorado.

Borgerhoff Mulder, M.B., Bowles, S., Hertz, T., Bell, A., Beise, J., Clark, G., Fazzio, I., Gurven, M., Hill, K., Hooper, P.L., Irons, W., Kaplan, H., Leonetti, D., Low, B., Marlowe, F., McElreath, R., Naidu, S., Nolin, D., Piraino, P., Quinlan, R., Schniter, E., Sear, R., Shenk, M., Smith, E.A., Von Rueden, C. and Wiessner, P., 2009. Intergenerational Wealth Transmission and the Dynamics of Inequality in Small-Scale Societies. *Science* 326, 682–688. https://doi.org/10.1126/science.1178336

Bowles, S., Smith, E.A. and Borgerhoff Mulder, M., 2010. The Emergence and Persistence of Inequality in Premodern Societies. Introduction to the Special Section. *Current Anthropology* 51, 7–17. https://doi.org/10.1086/649206

Braudel, F., 1958. Histoire et Sciences sociales. La longue durée. Annales. *Histoire et Sciences sociales* 13(4), 725–753.

Braudel, F. and Wallerstein, I., 2009. History and the social sciences. The longue durée. *Review (Fernand Braudel Center)* 32(2), 171–203.

Brozio, J.P., Müller, J., Furholt, M., Kirleis, W., Dreibrodt, S., Feeser, I., Dörfler, W., Weinelt, M., Raese, H. and Bock, A., 2019. Monuments and economies. What drove their variability in the middle-holocene neolithic? *The Holocene* 29(10), 1558–1571.

Cisney, V.W. and Morar, N., 2015. Biopower. Foucault and Beyond. Danvers: University of Chicago Press.

Conkey, M.W. and Gero, J.M., 1997. Programme to practice. Gender and feminism in archaeology. *Annual Review of Anthropology* 26(1), 411–437. https://doi.org/10.1146/annurev.anthro.26.1.411

Crumley, C.L., 1995. Heterarchy and the Analysis of Complex Societies. *Archaeological Papers of the American Anthropological Association* 6, 1–5.

Crumley, C.L., 2005. Remember How to Organize. Heterarchy Across Disciplines. *In:* C.S. Beekman and W.W. Baden, eds. *Nonlinear Models for Archaeology and Anthropology. Continuing the Revolution*. London: Routledge, 35–50.

Cunningham, J.J. and MacEachern, S., 2016. Ethnoarchaeology as slow science. *World archaeology* 48(5), 628–641.

DeLong, J.B., 2022. *Slouching towards utopia. an economic history of the twentieth century*. New York: Basic Books.

Durkheim, E. 1982. The Rules of the Sociological Method. New York: The Free Press.

Durkheim, E., 1984. *The Division of Labor in Society*. New York: The Free Press.

Durkheim, E., 1995. The elementary forms of religious life. New York: The Free Press.

Feinman, G.M. and Carballo, D.M., 2018. Collaborative and competitive strategies in the variability and resiliency of large-scale societies in Mesoamerica. *Economic Anthropology* 5(1), 7–19.

Flannery, K. and Marcus, J., 2012. *The Creation of Inequality. How Our Prehistoric Ancestors Set the Stage for Monarchy, Slavery, and Empire*. London: Harvard University Press.

Foucault, M., 1980. *Language, counter-memory, practice. Selected essays and interviews*, Ithaca: Cornell University Press.

Foucault, M., 1990. *The History of Sexuality*, New York: Knopf Doubleday Publishing Group.

Frankenhuis, W. and Nettle, D., 2020. Current debates in human life history research. *Evolution and human Behavior* 41(6), 469–473. https://doi.org/10.1016/j.evolhumbehav.2020.09.005

Furholt, M., 2021. Resisting the 'violence-inequality complex'. A new model for third millennium BC mobility in Europe. *In:* V. Heyd, G. Kulcsár and B. Preda-Bălănică, eds. *Yamnaya Interactions. Proceedings of the International Workshop held in Helsinki, 25–26 April 2019*. Budapest: Archaeolingua, 57–82.

Garlitz, D., 2020. Durkheim's French Neo-Kantian Social Thought. Epistemology, Sociology of Knowledge, and Morality in The Elementary Forms of Religious Life. *Kant Yearbook* 12(1), 33–56.

Geertz, C., 1973. *The Interpretation of Cultures. Selected Essays*. New York: Basic Books Publishers.

Gopnik, A., 2016. *The gardener and the carpenter. What the new science of child development tells us about the relationship between parents and children*. New York: Farrar, Straus and Giroux.

Graeber, D. and Wengrow, D., 2021. *The dawn of everything. A new history of humanity*. Maximilan: Penguin.

Hayden, B., 2014. *The Power of Feasts. From prehistory to the present*. New York: Cambridge University Press.

Inglehart, R., 2015. *The silent revolution. Changing values and political styles among western publics*. Princeton: Princeton University Press.

Inglehart, R., 2018. *Cultural evolution. People's motivations are changing, and reshaping the world*. Cambridge: Cambridge University Press.

Inglehart, R. and Norris, P., 2017. Trump and the populist Authoritarian Parties. The silent revolution in reverse. *Perspectives on politics* 15(2), 443–454.

Jaeggi, A.V., Burkart, J.M. and Van Schaik, C.P., 2010. On the psychology of cooperation in humans and other primates. Combining the natural history and experimental evidence of prosociality. *Philosophical transactions of the royal society B: Biological Sciences* 365(1553), 2723–35.

Kaplan, H., Hill, K., Lancaster, J. and Hurtado, A.M., 2000. A theory of human life history evolution. Diet, intelligence, and longevity. *Evolutionary Anthropology* 9(4), 156–185.

Kohler, T.A. and Smith, M.E., 2018. *Ten thousand years of inequality. the archaeology of wealth differences. Amerind studies in archaeology*. Tuscon: University of Arizona Press.

Kristiansen, K., 1984. Ideology and material culture. An archaeological perspective. *In:* M. Spriggs, ed. *Marxist perspectives in archaeology*. London: Cambridge University Press.

Kristiansen, K., 2015. The Decline of the Neolithic and the Rise of Bronze Age Society. *In:* C. Fowler, J. Harding and D. Hofmann, eds. *The Oxford Handbook of Neolithic Europe*. Oxford: Oxford University Press.

Kristiansen, K. and Earle, T., eds., 2010. *Organizing Bronze Age Societies. The Mediterranean, Central Europe, and Scandinavia Compared*. Cambridge: Cambridge University Press.

Kuhn, T.S., 1996. *The Structure of Scientific Revolutions*. Chicago: University of Chicago Press. https://doi.org/10.7208/chicago/9780226458106.001.0001

Kuper, A., 2000. *Culture. The Anthropologists' Account*. Cambridge: Harvard University Press.

Lucas, G., 2017. The Paradigm Concept in Archaeology. *World archaeology* 49(2), 260–270.

Malinowski, B., 1922. *Argonauts of the Western Pacific. An Account of Native Enterprise and Adventures in the Archipelagoes of Melanesian New Quinea (1922).* London: George Routledge & Sons, Ltd.

Meadwell, H., 2023. Durkheim and realism. *Journal for the Theory of Social Behaviour* 53(4), 520–534.

Mele, D. and González-Cantón, C., 2014. The homo economicus model. *In:* D. Mele and C. González-Cantón. *Human Foundations of Management*. New York: Palgrave Macmillan, 9–29. https://doi.org/10.1057/9781137462619_2

Miller, D. and Tilley, C., eds., 1984. *Ideology, power and prehistory. New directions in archaeology*. Cambridge: Cambridge University Press.

Müller, J., Arponen, V.P.J, Hofmann, R. and Ohlrau, R., 2015. The appearance of social inequalities. Cases of neolithic and chalcolithic societies, *Origini* 38, 65–86.

Müller, J., 2018. Social memories and site biographies. Construction and perception in nonliterate societies. *In:* C.C. Bakels, Q.P.J. Bourgeois, D.R. Fontijn and R. Jansen, eds. *Local communities in the big world of prehistoric northwest Europe*, Analecta Praehistorica Leidensia 49. Leiden: Sidestone Press, 9–17.

Müller, J., ed., 2022. *Connectivity matters! Social, environmental and cultural connectivity in past societies, ROOTS studies*. Leiden: Sidestone Press.

Müller, J. and Bernbeck, R., eds., 2016. *Prestige – Prestigegüter – Sozialstrukturen. Beispiele aus dem europäischen und vorderasiatischem Neolithikum*, Archäologische Berichte Band 6. Bonn: Holos. https://doi.org/10.11588/propylaeum.1

Munson, J. and Scholnick, J., 2021. Wealth and Well-being in an Ancient Maya Community. A framework for studying the quality of life in past societies. *Journal of Archaeological Method and Theory* 29, 1–30.

Nussbaum, M. and Sen, A., eds., 1993. *The Quality of Life*. Oxford: Clarendon Press.

Oka, R., Ames, N., Chesson, M.S., Kuijt, I., Kusimba, C.M., Gogte V.D. and Dandekar, A., 2018. Dreaming beyond gini. Methodological steps toward a composite archaeological inequality index. *In:* T. Kohler, *Ten thousand years of inequality. The archaeology of wealth differences.* Tucson: The University of Arizona Press

Persky, J., 1995. The Ethology of Homo Economicus. *Journal of Economic Perspectives* 9, 221–231.

Prentiss, A.M., 2021. Theoretical Plurality, the Extended Evolutionary Synthesis, and Archaeology. *Proceedings of the Nation-al Academy of Sciences of the USA* 118(2), e2006564118.

Prentiss, A., Kuijt, I. and Chatters, J.C., 2009. *Macroevolution in human prehistory. Evolutionary theory and processual archaeology*. New York: Springer.

Price, T.D. and Feinman, G.M., eds., 2010. *Pathways to Power. New Perspectives on the Emergence of Social Inequality* (2010). New York: Springer.

Rachman, G., 2022. *The age of the strongman. How the cult of the leader threatens democracy around the world*. New York: Other Press.

Raworth, K., 2017. *Doughnut economics. Seven ways to think like a 21st-century economist*. London: Random House.

Ray, C. and Fernández-Götz, M., 2019. *Historical ecologies, heterarchies and transtemporal landscapes*. London: Routledge.

Ready, E. and Holton Price, M., 2021. Human behavioral ecology and niche construction. *Evolutionary anthropology* 30, 71–83.

Robb, J. and Harris, O.J.T., 2018. Becoming gendered in european prehistory. Was neolithic gender fundamentally different? *American Antiquity* 83(1), 128–147. https://doi.org/10.1017/aaq.2017.54

Rosenswig, R.M. and Cunningham, J.J., eds., 2019. *Modes of production and archaeology*. Gainesville: Florida University Press.

Sahlins, M., 1972. *Stone Age Economics*. Chicago: Adeline.

Sear, R., 2020. Do human 'life history strategies' exist? *Evolution and Human Behavior* 41(6), 513–526. https://doi.org/10.31219/osf.io/hjezb

Sen, A., 1992. *Inequality Reexamined*. New York: Russell Sage Foundation.

Sen, A., 2014. The contemporary relevance of buddha. *Ethics and international affairs* 28(1), 15–27. https://doi.org/10.1017/s0892679414000033

Service, E. and Sahlins, M., 1960. *Evolution and culture*. Ann Arbor: University of Michigan Press.

Shanks, M. and Tilley, C., 1988. *Social Theory and Archaeology*. Cambridge: Polity Press.

Shennan, S., 2008. Evolution in Archaeology. *Annual Review of Anthropology* 37, 75–91.

Smith, M.E., 2019. Quality of life and prosperity in ancient households and communities. *In:* C. Isendahl and D. Stump, eds. *The oxford handbook of historical ecology and applied archaeology*. Oxford: Oxford University Press.

Thurston, T.L., 2019. "Can you hear me now?" Heterarchy as an instrument and outcome of collective action in Iron Age and Medieval Europe. *In:* C. Ray and M. Fernández-Götz, eds. *Historical Ecologies, Heterarchies and Transtemporal Landscapes*. London: Routledge.

Tomasello, M., 2009. *Why We Cooperate*. Cambridge: MIT Press.

Trigger, B.G., 1993. Marxism in Contemporary Western Archaeology. *In:* M.B. Schiffer, ed. *Archaeological Method and Theory*. Tucson: The University of Arizona Press.

Warfield Rawls, A., 2011. Wittgenstein, Durkheim, Garfinkel and Winch. Constitutive Orders of Sensemaking. *Journal for the Theory of Social Behaviour* 41(4), 396–418.

Wolff, R.D. and Resnick, S.A., 2006. *New Departures in Marxian Theory*. London: Routledge.

Wylie, A., 1989. Archaeological Cables and Tacking. The Implications of Practice for Bernstein's 'Options Beyond Objectivism and Relativism'. *Philosophy of the Social Sciences* 19, 1–18.

The Visibility of Rural Settlement Hierarchy in Plant Remains
The Case of 1st and 2nd Century CE Sites in Oss, the Netherlands

Corrie Bakels

To my colleague Johannes Müller, who values archaeobotanical investigations.

KEYWORDS: *social inequality, plant remains, rural Roman Iron Age, Oss*

Abstract

Rural settlements that were inhabited during the 1st and 2nd century CE north of the present town of Oss, the Netherlands, were arranged in clusters. Within each cluster, settlements were not of equal size and importance, but show a distinct hierarchy with a single central place at the top of the ladder. The inequality in rank is also visible in the plant remains retrieved during the excavation of these sites. The central places are characterised by a number of food plants with a background in Roman cookery. These are lacking in the other settlements. The only plant with a Mediterranean origin found outside the central places is chard, a leafy vegetable that resembles plants which traditionally were gathered from the wild. This plant might have been adopted more readily by people who did not belong to the local elite.

Samenvatting

Gedurende de eerste twee eeuwen na Chr. waren de plattelandsnederzettingen ten noorden van het hedendaagse Oss georganiseerd in clusters. De nederzettingen binnen een cluster waren niet even groot en niet allemaal even belangrijk. Per cluster was er sprake van een hiërarchie met aan de top één centrale plaats. Die ongelijkheid is ook terug te vinden in de opgegraven plantenresten. De centrale nederzettingen worden gekenmerkt door voedselgewassen uit de mediterrane Romeinse keuken. Deze producten ontbreken op de andere plaatsen, met als uitzondering de snijbiet. Mogelijk leek deze bladgroente voldoende op de groentesoorten die voorheen uit het wild geplukt werden, en was daarom de drempel om dit gewas te gaan kweken voor mensen die niet tot de élite behoorden, voldoende laag.

INTRODUCTION

In 2010, Richard Jansen and Harry Fokkens published an article titled "Central places in 1st and 2nd century CE in the Maaskant-region (Southern Netherlands), reinterpreting the Roman period settlement of Oss-Westerveld" (Jansen and Fokkens 2010). In their paper, they reviewed data from a series of excavations within a restricted region and concluded that settlements were not of equal size and importance. Four settlement types were distinguished: solitary farmyards (*Einzelhöfe*), small rural settlements with two to three farmhouses, large rural settlements with four to five farmhouses and central settlements with more than four to five houses. These rural settlements were inhabited contemporaneously during the 1st and 2nd century CE. They were situated at the northern edge of the Roman Empire and would internationally be classified as Roman Iron Age sites. The site types were placed in a hierarchical order with the central settlements at the top of the ladder (Table 1). A central settlement is the core of a cluster in which the other types occur as satellites. Two examples were distinguished north of the present town of Oss, one with the site Westerveld at its centre and the other

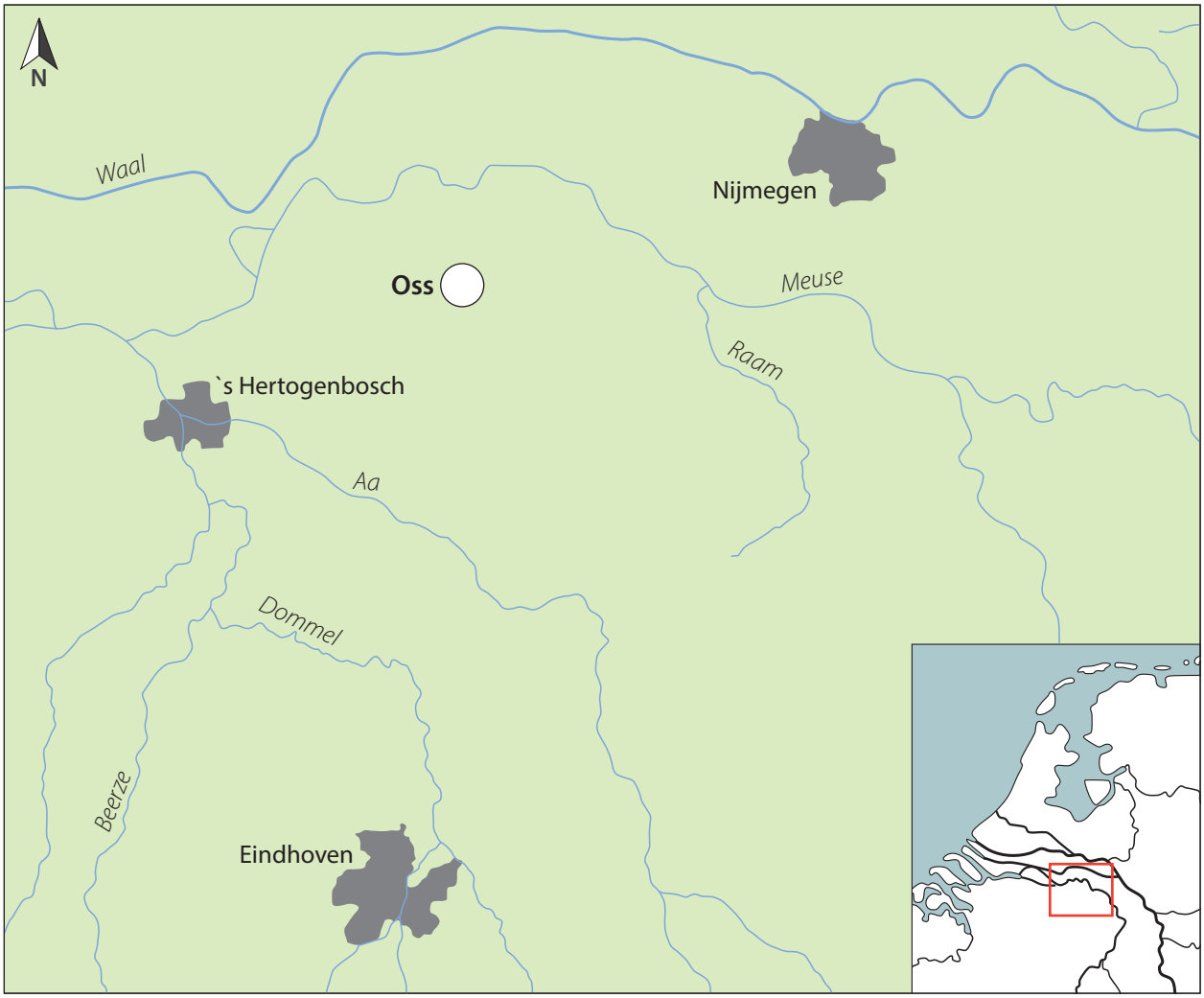

Fig. 1. The location of Oss, the Netherlands (Graphic: Karin Winter).

with Horzak II as the central place (Fig. 1 and Fig. 2). The hierarchy is not only based on the size of the settlements but also on settlement structure and the remains of material culture found in them. For instance, the Westerveld excavation revealed a house with a partially tiled roof, built in a style inspired by Roman examples. The other dwellings were presumably thatched.

The question posed in the present paper is whether the inequality in status is also visible in the plant remains retrieved from the two clusters. The search was inspired by a study of Oss-Westerveld (in the following indicated as Westerveld), which suggested the presence of inequality (Bakels *et al.* 1997).

Table 1. Settlement types in the rural landscape of the Maaskant region north of the town centre of present-day Oss, the Netherlands (after Jansen and Fokkens 2010, 78 table 1).

Type	Characteristics	Settlements Oss
Einzelhöfe	Solitary farmyard, one of more phases, sometimes enclosed	De Geer I; De Geer II; Schalkskamp?
Small rural settlement	2–3 farmhouses, several phases, sometimes enclosed	Schalkskamp?; Vijver; IJsselstraat; Zaltbommelseweg; Horzak I
Large rural settlement	4–5 farmhouses, several phases, sometimes enclosed	Zomerhof; Horzak II?
Central settlement	>4–5 (farm)houses, several phases, sometimes enclosed, porticus house, local chief, designed layout	Westerveld; Horzak II?

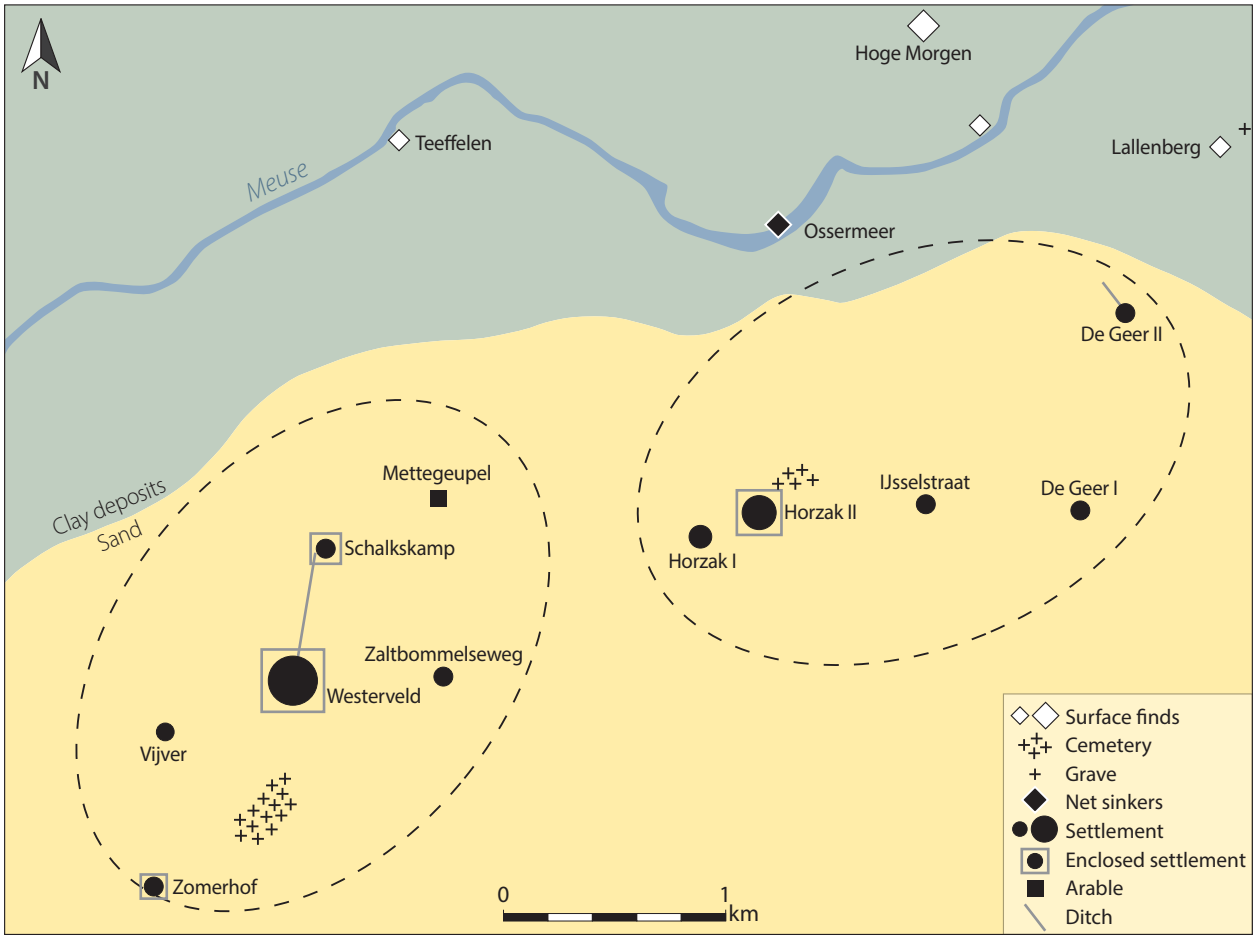

Fig. 2. Settlement clusters in the Maaskant region north of the town centre of present-day Oss, the Netherlands (after Jansen and Fokkens 2020, 75 fig. 7).

MATERIAL AND METHODS

During several excavations, samples were taken for botanical analysis. Wells, pits and postholes were sampled. The sediments were sieved in the botanical laboratory of the Faculty of Archaeology, Leiden University, the Netherlands. The finest mesh used was 0.25 mm. Plant matter was handpicked out of the residues with the help of a microscope with 6 x to 12 x magnification. Identification was done mainly by comparison with specimens in the extensive reference collection of the laboratory. Most results have been published in articles or mentioned in internal reports.

Not every settlement was sampled. Some were investigated during short-lived excavations of restricted size, i. e. the sites Zaltbommelseweg and Horzak I. The site De Geer II also provided no samples. From the settlements mentioned in table 1, the sites De Geer I, Schalkskamp, Vijver, IJsselstraat, Zomerhof, Horzak II and Westerveld provided the data used in the present paper. Results are presented per individual settlement.

For comparison, the taphonomy should be considered. The plant remains are preserved either in a waterlogged condition or in a charred state. These categories cannot simply be mixed. The choice fell on the comparison of waterlogged samples from wells (Table 2). Waterlogging preserves many plant species. Cereal grains are at disadvantage, but are represented by their chaff. Pulses are also not well-represented, which should be kept in mind, but most other plants used by the inhabitants of the settlements should appear in wells.

Comparison follows two lines. The first is comparison of frequency, also called ubiquity, of plants considered to have been consumed by the inhabitants. The category includes linseed/flax which also provides fibres. Two taxa are omitted: oat (*Avena*), because it is not clear whether the remains found belong to cultivated oat or to the possible weed *Avena fatua*, and rye (*Secale*) because the single grain found is interpreted as a weed (Bakels *et al.* 2017). In contrast, one

Table 2. Waterlogged plant remains found in wells in the four settlement categories: food plants in frequency based on number of samples and wild herbs presented in number of species per site. Plants known to have been absent before the Roman occupation are depicted in ***red****. Where table 1 presents uncertainty concerning allocations, a choice was made after consulting the original authors.*

	Solitary farmyard		Small rural settlement		Large rural settlement	Central settlement	
Frequencies, % samples	**De Geer I**	**Schalkskamp**	**Vijver**	**IJsselstraat**	**Zomerhof**	**Horzak II**	**Westerveld**
N wells	1	3	7	3	6	9	7
N samples	1	3	12	3	7	15	18
Cultivated cereals							
Hordeum vulgare, hulled barley	0	67	42	100	43	27	39
Panicum miliaceum, millet	0	33	100	67	29	82	72
Triticum dicoccum, emmer wheat	0	0	8	33	14	20	39
Triticum spelta, spelt wheat	0	0	0	0	14	7	17
Pulses							
Vicia faba, Celtic bean	0	33	0	0	0	0	0
Oil and fiber plants							
Brassica rapa, rape seed	0	0	8	0	0	27	16
Camelina sativa, gold of pleasure	0	0	0	0	0	13	0
Linum usitatissimum, linseed	0	0	42	0	14	27	39
Papaver somniferum, poppy	0	0	0	0	0	**13**	**6**
Kitchen herbs *etc.*							
Anethum graveolens, dill	0	0	0	0	0	**7**	**6**
Apium graveolens, celery	0	0	0	0	0	0	**6**
Beta vulgaris, chard	0	0	**17**	0	**29**	0	**11**
Coriandrum sativum, coriander	0	0	0	0	0	0	**22**
Satureja hortensis, savory	0	0	0	0	0	0	**6**
Nuts and fruits							
Juglans regia, walnut	0	0	0	0	0	0	**6**
Malus sp., apple	0	0	25	0	0	0	6
Prunus insititia, plum	0	0	0	33	0	0	0
Nuts and fruits, wild							
Corylus avellana, hazelnut	0	0	17	0	0	0	17
Prunus spinosa, sloe plum	0	0	33	67	0	27	6
Rubus fruticosus, blackberry	0	0	83	0	57	25	33
Rubus idaeus, raspberry	0	0	8	0	14	0	14
Sambucus nigra, elderberry	0	0	67	67	14	0	67
Vaccinium myrtillus, bilberry	0	0	0	0	14	0	0
'Roman' crop weed							
Agrostemma githago, corncockle	0	0	0	0	0	**13**	**6**
Wild herbs							
N taxa crop weeds in site	5	10	20	19	16	20	22
N total wild herbs in site	28	37	121	80	90	80	131
Percentage crop weeds in site	17.8	37.0	16.5	26.8	17.8	25.0	16.8

weed, corncockle (*Agrostemma githago*), is added for reasons mentioned below. Frequency informs on the presence of plants in relation to the number of investigated features. This approach is chosen because the actual number of plant remains counted in the residues gives haphazard information. The reasoning behind using frequencies is that the more often a plant is used, or occurs, the more often the chance that it turns up somewhere archaeologically. The frequency applied in this paper is calculated on the basis of

samples. Several wells provided more than one sample. In those cases, different layers of fill were investigated and it is assumed that they represent independent events of disposal.

The second line is to look for differences in the handling of crops. It might be that the inhabitants of the central settlements did less primary handling of crops than those of the other kinds of settlements. As chaff remains turned out to be extremely scarce, the choice fell on the consideration of crop weeds. 24 species of herbs were registered apart from the remainder of wild herbs. These species are characteristic for the phytosociological class *Stellarietea mediae* and the choice is based on the list published by Haveman, Schaminée and Weeda (Haveman *et al.* 1998). The reasoning is that in settlements where crops were handled regularly, more crop weeds would appear in the herb category than in those where the inhabitants consumed products cleaned elsewhere. A kind of producers versus consumers case. Comparison of sheer numbers of species is senseless, because the more samples are analysed, the more species will be found, at least until the saturation curve reaches its upper limit. The data are not good enough for this. The solution is to look at proportions, i. e. the percentage of crop weeds based on the total count of herb species.

RESULTS

The frequency of consumed plants and the share of crop weeds in the wild herb category are presented in table 2. In total, 59 samples from wells were investigated. Comparison of the four settlement categories is hampered by the fact that samples are not evenly distributed. One factor is that the number of farmyards and wells is not the same for every category due to their theoretical basis: the more yards, the more wells. Moreover, it is not so that a multitude of, for example, solitary farmyards surrounded a single central place. Their number is very restricted. Another factor is that the data were not created for the present purpose, but are a collection of samples taken at different times, with different goals, and different budgets for analysis. Notwithstanding all this, the results offer some insights.

In table 2, plants which are known to have been absent before the Roman occupation of the district are depicted in red. They include opium poppy (*Papaver somniferum*), dill (*Anethum graveolens*), celery (*Apium graveolens*), beet (*Beta vulgaris*), coriander (*Coriandrum sativum*), savory (*Satureja hortensis*), walnut (*Juglans regia*) and the crop weed corncockle (*Agrostemma githago*). Although opium poppy in its variety *P. somniferum* var. *setigerum* is known since the Neolithic, the opium poppy found in Horzak II and Westerveld is the true opium poppy. Beet and celery are native to the salt-sprayed Dutch seacoast, but do not grow inland and are not recorded from pre-Roman settlements there (RADAR 2012). Dill, coriander, savory and walnut are well-established Roman introductions (Bakels and Jacomet 2003). The crop weed corncockle arrived with wheat delivered to the Roman army (Bakels 2010). It is clear that all plants with a Roman background, beet excepted, are limited to the central settlements. This difference between the central settlements, on the one hand, and the other three kinds of settlements, on the other hand, is statistically valid. The other food plants do not display such difference. They belong to the food plant spectrum common to the region: hulled six-row barley (*Hordeum vulgare*, subsp. *vulgare*), emmer wheat (*Triticum dicoccum*), millet (*Panicum miliaceum*), Celtic bean (*Vicia fab*a var. *minor*), linseed (*Linum usitatissimum*), rape seed (*Brassica rapa*) and a range of gathered fruits and nuts (Bakels 2019a, 148; Bakels *et al.* 2017). Spelt wheat, too, is known to have been grown prior to the Roman occupation. Gold of pleasure (*Camelina sativa*) is surprisingly absent in the list of samples taken in the non-central settlements. In the Iron Age, it was a very common crop (Bakels 2019b).

A closer look at the plants with an origin in Roman culture reveals that the only plant found outside the central settlements, beet, is a leafy vegetable, known today as chard. Beetroots were not yet known at the time. They are cultivated from historical times onwards (Goldman and Janick 2021). The excavated material concerns seeds, but those are not eaten and must be considered as waste from cleaning chard, or as sowing seed. Beet must have been cultivated locally.

The herbs retrieved from the central settlements are to be considered as condiments. They may have been cultivated in a separate kitchen garden, but some that are not or not only used green, but also as a seed, for instance coriander, may have been imported from elsewhere. Herbs like the ones found at the sites north of present-day Oss were part of sauces and dressings, and were indispensable in Roman upper-class cookery. To quote Don and Patricia Brothwell:

> *"By the time Rome was at its zenith the list of herbs and spices used in cookery for the upper classes was formidable."* Brothwell and Brothwell (1969, 158)

It is feasible that especially the principal inhabitants of Westerveld wanted to live up to this standard. The observation that chard was adopted more widely may

tentatively be explained by the appearance and taste of this plant. It resembles more or less wild leafy herbs like goosefoots, which are considered to have been widely consumed in prehistory.

Walnut also may have been imported. It is not yet proven that the actual tree was planted in the 1st and 2nd century CE in the very northern parts of the Roman Empire. On the very Romanised farms on loess soils in the German Rhineland and the Dutch Southern Limburg, the tree seems to have been planted from the end of the 2nd century CE onwards (Bunnik 1999, 162). Spelt wheat and corncockle turn up only in the central settlements and it is quite possible that there is a relation between the two. Spelt wheat is known to have been grown in the region before the Roman occupation (Bakels 2019a, 148), but it is also known that the farmers running the Roman *villae rusticae* in the loess-covered areas upstream of the river Meuse grew spelt on an industrial scale (Bakels 2009, 167). The product contained the weed corncockle. It is notoriously difficult to get rid of corncockle during the cleaning of grain as its seeds are almost equal in size and weight. It, therefore, is not unthinkable that the spelt wheat found in Roman Oss was imported. The Meuse River is not far off.

Charred seeds and fruits should bear out the picture drawn on the basis of the remains retrieved from wells, but are rather scarce. The stray, often single specimens of crops or gathered plants belong to hulled six-row barley, emmer wheat, millet, Celtic bean, hazelnut and blackberry. The finds do not disclose any difference between the settlements.

The second line of analysis concerns the proportion of crop weeds in relation to the total list of wild herbs. The percentages are also presented in table 2. The values do not reveal differences. The percentage of crop weeds in the solitary farmyard De Geer I, for instance, is not far from that found in Westerveld. The conclusion must be that all four settlement types were inhabited by crop producing farmers, which does not come as a complete surprise. All settlements consisted of farms. The presence of a household belonging to the rural elite in the central places makes no difference in subsistence practices.

The question posed at the beginning: *"Is the inequality between settlements and their inhabitants as described by Jansen and Fokkens also visible in the plant remains?"* can be answered with yes, but to a certain point. The rural economy is basically the same. The local elite living in the central places at the top of the ladder are distinguished not so much by their staple food ingredients, but by a taste for flavouring their meals in Roman style. The three lower categories of settlement are not distinguishable.

DISCUSSION AND CONCLUSION

Social inequality as expressed in the footprint of food is most often looked for in urban settings. The analysis of cesspits and more has been conducted *e.g.* in Lübeck, 's-Hertogenbosch and Maastricht (Stephan 1978; Van Haaster 1989; 2003; Bakels and Groen-Houchin 2017). Rural societies have seldom been investigated. De Hingh and Bakels (1996) studied a 7th–8th century CE rural demesne in Northern France: Serris-Les Ruelles. The site showed a bipartite structure based on social difference. On the one hand, there was the manor house with its stone foundation, tiled roof, glass windows and snippets of gold wire in the waste. On the other hand, there was the peasant village with its wattle-and-daub structures. Analysis of the plant remains left behind by the inhabitants revealed no difference between the two social classes, not even in the spectrum of condiments like coriander or remains of cultivated fruit. Nevertheless, the difference was clear enough in the bone spectrum. The conclusion was that the lord and his family consumed the same plant food as the peasants, but perhaps in smaller amounts, cooked in a different way, and with more meat as part of their meals.

The case of Oss provides evidence that vegetable ingredients may indeed mark an upper class in very rural societies. But whether this outcome may prove to represent the common situation cannot be concluded on the basis of a single case. More investigations are clearly needed. Recent research done in Denmark on a Late Bronze Age site revealed that a new foodstuff, in this case millet, was first adopted by the households of settlements with a locally higher status (Sørensen *et al.* 2023). This might have been a universal trend. It would be interesting to investigate who in rural societies were the first to adopt new foodstuffs and who were the first to cultivate them.

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REFERENCES

Bakels, C., 2009. *The Western European Loess Belt, Agrarian History, 5300 BC–AD 1000*. Dordrecht: Springer.

Bakels, C., 2010. De vroegste vondsten van bolderik (*Agrostemma githago* L.) in Nederland / The earliest finds of corncockle (*Agrostemma githago* L.) in the Netherlands. *In*: C. Bakels, K. Fennema, W.A. Out and C. Vermeeren, eds. *Van planten en slakken / of plants and snails*. Leiden: Sidestone Press, 13–20.

Bakels, C., 2019a. Vegetation and crops in Oss-North. *Analecta Praehistorica Leidensia* 48, 127–153.

Bakels, C., 2019b. Een ijzertijdboer zaait huttentut (with english abstract). *Metaaltijden* 6, 185–191.

Bakels, C. and Jacomet S., 2003. Access to luxury foods in Central Europe during the Roman period: the archaeobotanical evidence. *World Archaeology* 34(3), 542–557.

Bakels, C. and Groen-Houchin, R., 2017. Socio-economic status and plant remains: Maastricht (the Netherlands). *Analecta Praehistorica Leidensia* 47, 259–270.

Bakels, C., Wesselingh, D. and Van Amen, I., 1997. Acquiring a taste: the menu of Iron Age and Roman-period farmers at Oss-Ussen, the Netherlands. *Analecta Praehistorica Leidensia* 29, 193–211.

Bakels, C., Van der Jagt, I. and Jansen, R., 2017. Livestock and plant resources in rural sites on sandy soil in the very north of northeastern Gaul. *In*: S. Lepetz and V. Zech-Matterne, eds. *Productions agro-pastorales, pratiques culturales et élevage dans le nord de la Gaule du deuxième siècle avant J.-C. à la fin de la période romaine*. Archéologie des Plantes et des Animaux 05. Quint-Fonsegrives: Éditions Mergoil, 75–84.

Bakels, C., Wesselingh, D. and Van Amen, I., 1997. *Food in Antiquity*. London: Thames and Hudson.

Bunnik, F., 1999. *Vegetationsgeschichte der Lößbörden zwischen Rhein und Maas, von der Bronzezeit bis in die frühe Neuzeit*. PhD thesis. Utrecht: Utrecht University.

De Hingh, A. and Bakels, C., 1996. Paleobotanical evidence for social difference? The example of the early medieval domain of Serris-Les Ruelles, France. *Vegetation History and Archaeobotany* 5(1), 117–120.

Goldman, I.L. and Janick, J., 2021. Evolution of root morphology in table beet: historical and iconographic. *Frontiers in Plant Science* 12, August 2021.

Haveman, R., Schaminée, J.H.J. and Weeda, E.J., 1998. Stellarietea mediae. *In:* JHJ. Schaminée, EJ. Weeda and V. Westhoff, eds. *De Vegetatie van Nederland* 4. Uppsala/Leiden: Opulus Press, 199–246.

Jansen, R. and Fokkens, H., 2010. Central places in the 1st and 2nd century AD in the Maaskant-region (Southern Netherlands), Reinterpreting the Roman settlement of Oss-Westerveld. *Probleme der Küstenforschung* 33, 68–81.

RADAR 2012. Dutch Relational Archaeobotanical Database version 2012.

Sørensen, C., Mose Jensen, P., Nørgaard Nielsen, S. and Kanstrup, M., 2023. Late Bronze Age Millet Farmers at Ambjerg N: An archaeobotanical analysis and a review of Late Bronze Age millet in Denmark. *Vegetation History and Archaeobotany* 33, 425–440. https://doi.org/10.1007/s00334-023-00947-9

Stephan, H.-G., 1978. Archäologische Ausgrabungen im Handwerkviertel der Hansestadt Lübeck (Hundestrasse 9–17): ein Vorbericht. *Lübecker Schriften zur Archäologie und Kulturgeschichte* 1, 75–80.

Van Haaster, H., 1989. Spätmittelalterliche und frühneuzeitliche Pflanzenreste aus der Grabung in der Hundestrasse 9–17, Lübeck. *Lübecker Schriften zur Archäologie und Kulturgeschichte* 16, 271–290.

Van Haaster, H., 2003. *Archeobotanica uit 's-Hertogenbosch*. PhD thesis. Amsterdam: Amsterdam University.

Affordances in Archaeology – The Case of Mesopotamia

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KEYWORDS: *affordance, canonical, foreseeability, handaxe, clay*

Abstract

The concept of "affordances" has become a major preoccupation in Science and Technology Studies (STS), ecological psychology and other disciplines. More recently, the notion has been picked up in archaeology. In this contribution, I differentiate between canonical and general affordances. Furthermore, I discuss some archaeological contexts where affordance plays a role in dyadic relations between people and things, but also in whole technological systems. I conclude with a call for a critical and differentiated use of the concept that takes links between different kinds of affordances into account.

Zusammenfassung

„Affordanzen" sind zu einem wichtigen Thema in den science *and* technology studies *(STS), der Ökopsychologie und anderen Disziplinen geworden. In jüngster Zeit wurde der Begriff auch von der Archäologie aufgegriffen. In diesem Beitrag folge ich dem Vorschlag, zwischen kanonischen und allgemeinen Affordanzen zu unterscheiden. Außerdem erörtere ich einige archäologische Kontexte, in denen Affordanz eine Rolle spielt: in dyadischen Beziehungen zwischen Menschen und Dingen, aber auch in ganzen technologischen Systemen. Ich schließe mit einem Plädoyer für einen kritischen und differenzierten Gebrauch des Konzepts, der die Verbindungen zwischen verschiedenen Arten von Affordanzen berücksichtigt.*

"Affordances" have become an important topic in archaeological theories (Llobera 1996; Ingold 2000; Knappett 2004; Keane 2018). In the first part of this contribution paper, I discuss the conceptual background of affordance thinking. In the second, I use Mesopotamia as an example to demonstrate the close interlinking of matter, objects and effects in affordances. I devote these reflections to Johannes, *"carpaccio comrade"* and provider of mental beverages. Our friendship reaches back some 30 years to a co-taught seminar on prestige goods (Müller and Bernbeck 1996), a time when we were both "academic researchers" (WiMis) at the Freie Universität Berlin.

Some years ago, during an archaeometric workshop on pottery from the 4th millenium BCE Uruk period in Mesopotamia, a dispute arose when one participant claimed that the pottery of northern Mesopotamia was worse than that from the south because it was much more porous and fired at lower temperatures. Furthermore, so the underlying idea, we can trace a tendency towards 'better' pottery through the ages, ending with high-quality wares such as the *terra sigillata* in Roman antiquity. Other colleagues argued that the porosity of the pottery and low firing may simply not have mattered in certain social contexts. The dispute ignited for two reasons, the material characteristics on the one hand, and the assumption of a more or less successful implementation of intended vessel properties on the other. In archaeology, the material characteristics are measurable but not the intentions behind them.

This discussion highlights a background problem of archaeology that belongs to a broader intellectual history concerning processes of labor. In current archaeological thought, notions such as a "social life of things" (Appadurai 1986) and "operational chains" play an important role (Arntz and Lewis 2020). If we stay with clay and vessels, we talk about kneading, the addition of certain types of temper depending on the intended function of a vessel, firing atmospheres and temperatures in kilns, and other steps in a production process.

The unspoken premise of many considerations of production – here of ceramic production – is that past and present subjects, whether individual or collective, first formed an image of what was to be produced in order to then attempt to realize it; in short, what archaeologist James Deetz (1967, 47) called a "mental template". He defined it as follows:

"The idea of the proper form of an object exists in the mind of the maker, and when this idea is expressed in tangible form in raw material, an artifact results. The idea is the mental template from which the craftsman makes the object. The form of an artifact is a close approximation of this template, and variations in a group of similar objects reflect variation in the ideas which produce them."

For James Deetz, there is a clear separation between "mind" and "matter", whereby the mind conceptualizes what is later implemented as a thingly reality. This "representative concept of the mind" assumes an external object world, a filter of sensory perception and its image that exists in the brain. Humans, so this implicit "theory", can reverse that representational relation by constructing the image first.

This traditional idea about the relations between human beings and their environment belongs to a Cartesian philosophy of the subject that still prevails in current worldviews. Today, this simplistic concept of a simple distinction between active subjects and passive objects underlies many neuroscientific studies and clinical psychology (*e.g.* Svrakic and Zorumski 2021) and, interestingly, theories of artificial intelligence (*e.g.* Romeo 2024). Think first, then act seems to be the maxim behind these ideas. Human imagination precedes creation, and creation can only be a human practice. People in northern Mesopotamia, to come back to the initial example, had a sort of impoverished mental template that did not live up to an efficient realization of their goals.

Affordance, a concept developed in ecological psychology, was intended to replace the "representational concept of mind" by discarding the assumed independence of the human mind from surrounding matter. James Gibson (1979) formulated the principles of this kind of psychology in the second half of the 20th century under the influence of earlier *Gestalt* psychology (*e.g.* Koffka 2009). Gibson assumes the possibility of *direct perception* that does not take the detour of a model of indirect perception: from reality via perception to the (three-dimensional) reconstruction in the brain and the potential of an action.

So, if "direct perception" exists, how does it work? It is precisely at this point that the concept of affordance as conceived by James Gibson initially appears as a complement, albeit a necessary one, to direct perception. James Gibson is fundamentally concerned with ecological psychology, not just with the psychology of humans but with the perceptual capacity of all living beings. However, it is quite clear that James Gibson's ecological theory is based on complex animals: specific twigs and branches of trees may afford a squirrel a possibility to build its nests.

Simplistic scenarios such as the relation between humans and chairs are popular in the affordance literature in the human domain (Keane 2018, 31). A chair's height makes it suitable for most people to sit on — small children excluded. However, depending on the situation, it can also be used to climb on in order to take a photo of a group of people, to change a light bulb, or similar kinds of actions.

As an aside, we can note that capitalism restricts affordances as much as possible in order to increase sales. One of the best examples for this connection between sharply restricted affordances and consumption are the catalogs on airplanes with their fripperies for sale, from electric egg cookers that note time with music[1] to nasal hair shavers to anti-theft devices for garden lamps. These things all have an extremely limited range of uses when compared to a knife which can also be used as a screwdriver, scraper, a stabilizer for uneven tables, and more. For a knife, there is no need to form a concrete image of its properties or learn about them. One should rather distinguish between the properties of a thing and its affordances. Affordances are potentials of things and their environment, but they do not necessarily have to be realized.

If a thing "offers itself" for a certain use but is ignored by a living being who encounters it, it does not lose its affordances. The chair retains the potential to be climbed on as long as it has three (or more) legs. In the following, I discuss a few issues of affordance, some commonly recognized, others barely discussed. I then illustrate my points with an archaeological example.

1 "Smoke on the water" for soft boiled, "The final countdown" for hard boiled eggs; see: https://www.e-issue.co.uk/lufthansa/inflightshopping/page 27; last access 20th September 2025

1. Affordances differ from potential functions and properties of things because they are only realized in a relation. This point is more decisive than the potential alone since affordance involves direct perception, as James Gibson puts it:

   "Affordance cuts across the dichotomy of subjective — objective and helps us to understand its inadequacy. It is equally a fact of the environment and a fact of behavior. It is both physical and psychical, yet neither. An affordance points both ways, to the environment and to the observer."
   Gibson (1979, 119)

   From an explicitly multispeciesist[2] perspective, it is easy to understand that affordances, as relational effects, can be highly variable. A green meadow offers itself as food to a sheep, but less so to a cat, a fly or a professor of prehistory.

2. Affordance is not only a potential that is complementary to direct perception, but the characteristic relationality is spontaneous. Things do not have affordances, even though they have properties: a meadow "has" the color green, a knife has a sharp edge. In contrast, an affordance is a spontaneously realized relationship for which not just a thing but also a very specific human subject or other living being is a prerequisite. The temporal character of an encounter emerges from the contingent conditions of affordances: spontaneity as opposed to routine and repetitiveness, albeit not a completely aleatory one. Edmund Husserl describes this perceived-unreflected flow of time into the future as "protention" (see Merleau-Ponty 1945, 478), the moment passed as a retention with the sense that it is no longer to happen; past and future, experience and expectation are much larger than the *Zeithof*, sometimes translated as "time aureole". Perhaps the best expression for such an embodied temporality is Pierre Bourdieu's "feel for the game" (Bourdieu 1998, 80).
   So far, the question of chairs, meadows or knives sounds more like pseudo-philosophy by a naïve person than socially or historically relevant reflections. Indeed, James Gibson and other scholars can be accused of unjustifiably neglecting the collective, social, political and historical dimensions of the material world.
3.

Recognizing this problem, Alan Costall distinguished two types of affordance, a "canonical" and a "general" affordance. He attributes the former to artifacts, i.e. human-made things. The reason is simple, and perhaps one that actually threatens the usefulness of the concept of affordance itself. According to Alan Costall (1995; 2012; cf. Fisher 2004), objects that are produced with a specific purpose are fundamentally different in their affordances for human beings than those that they simply encounter in nature. It is a question of the "design" of the artifacts whose purposefulness refers to a relatively narrow or broad potential for use that they offer. Alan Costall discusses affordances in the fields of history, politics and the social. This conceptualization is firmly rooted in an anthropocentric world. I illustrate the difference between canonical and general affordance by referring to two opinions about one category of things. Handaxes have been casually referred to as the "Swiss army knives" of the Upper Palaeolithic. They existed from around 1.5 million years ago to *c.* 50,000 years ago. This certainly makes them one of the longest-used type of object in human history. Archaeologists attribute this insurmountably long use life to their multifunctionality (Posnansky 1959). This poses an archaeological problem. For although it is possible to determine the difference between the properties of an object, such as shape, color and material, it is not possible to investigate all of its affordances. How did *Homo erectus* perceive their surroundings when making or encountering a handaxe? Can we speak of a "design" for the type of a thing that persisted for hundreds of thousands of years? Standard phenomenological thought cannot be mobilized for an answer since physical and cognitive differences between the makers and users, early hominins, on the one hand and us as *Homo sapiens* on the other prevents this. However, it would not be wrong to assume a great variability of affordant moments between handaxes and early hominins. They can therefore hardly be described as "canonical" in Alan Costall's sense. Or could they? Marek Kohn and Steven Mithen (Kohn and Mithen 1999) started a dispute over handaxes by claiming that they did not have great potential for action but should be interpreted primarily in evolutionary terms. Whoever makes the most beautiful, largest handaxe will find the fittest marriage partners for biological reproduction. This "sexy handaxe theory",

2 Terminology and feminist origins of this idea are laid out in Donna Haraway's work (Haraway 2007).

disputed but still discussed (*e.g.* Machin 2008; Hodgson 2009; McNabb *et al.* 2018), narrows the otherwise overestimated affordances of these objects to an equally unlikely "canonical affordance". One has to be a fervent devotee of sociobiology to follow Marek Kohn and Steven Mithen's argument. Others try to restrict the axes' vast field of affordances by devising methods to calculate their efficiency (Key and Lycett 2017) or by constructions that claim morphological continuity as a sign of foreseeability as a "trustworthy handaxe theory" (Spikins 2012). We learn from this archaeological dispute — and many others — that the profession is extraordinarily uncomfortable with the wide-open field of general affordances.

3. One might ask which historical conditions must be met in order to produce a "canonizing" tendency. Alan Costall makes the mistake of imagining his two kinds of affordances as separate, ahistorical types instead of conceptualizing the relation between general and canonical affordances of things as fluid and changing. Without historical change, canonical affordances could not emerge. To return to Pierre Bourdieu's expression, without the development of a game, there cannot be a feel for the game.

4. Affordance as a potential would be a tautology. So is peoples' ability to perceive their environment. Perception and attention are a matter of education (Ingold 2011, 354; Rietveld and Kiverstein 2014, 331), but they are also the result of unintended experiences that lead to a restricted realm of expectations (Koselleck 1985). The affordance of a thing or a set of things can exist continuously and over long periods of time, but relations to human beings can change fundamentally with the widening or narrowing of their perceptions. Horizons of perception have a history that deeply influence contingent situations.

5. However, this concept of a historically developing relation between two dynamic elements does not do justice to affordance in its full ecological dimensions, which include larger contexts. The world is not a laboratory, and a single person never encounters an individual object in complete isolation. Rather, this always happens in complex networked contexts in which the most diverse things and living beings are intertwined. The multifarious actions a hand axe has to offer depend not only on the people and their perceptual capacities, but also on the overall situation in which humans and axes encounter each other, including the time of day and season, threats from wild animals, terrain characteristics, seemingly unrelated issues such as the availability of water and many more (Keane 2018).

6. Another complementary term that is essential for an understanding of affordances is obstinacy. Kerstin Hofmann and Stefan Schreiber (Hofmann and Schreiber 2011) have made a convincing case that things do not only afford actions, but have also a propensity to limit them. The obstinacy of things is an ambivalent relation that can inhibit the situational, spontaneously arising encounter produced by direct perception. We do not have to look far in the world of archaeology to identify instances of past societies that ignored, somewhat inexplicably, this obstinacy of parts of their material surroundings.

One of the most stunning cases, largely ignored in archaeological discourse, is the domestication of wild cereals that occur in sparse natural stands in the so-called Fertile Crescent. The earliest period in which wild cereals were regularly harvested, the Natufian, dates to around 12,500 to 9500 BCE. In addition to the first long-term inhabited sites with round buildings, large numbers of ground-stone tool kits have been found, supposedly for the processing of grain (Dubreuil 2004; Belfer-Cohen and Hovers 2005). From today's perspective, growing cereals may seem sensible, but back then? Why would anyone harvest plants that could not even be eaten without a number of intermediate processing steps, from threshing and winnowing to husking and finally grinding and possibly roasting, cooking or baking? Why focus on such small grains for which bulk is needed since the nutritional value of one unit is negligible? Not only that, wild grain such as einkorn and emmer do not have a solid ear that can be easily harvested but have a brittle rachis that disintegrates at the slightest touch. These plants do anything but "offer themselves" to humans for domestication. In Kerstin Hofmann and Schreiber's terms, they are stubborn matter with narrow affordances. In the process of domestication, humans must have shown considerable obstinacy themselves, perhaps being attracted and repelled at the same time by these plants.

CLAY AND WATER

I conclude my contribution with a concrete, landscape-derived archaeological example of affordance that concerns the geographical region of "Greater Mesopotamia", a term used for a region from the Mediterranean coast — I include here the southern Levant — in the west to the Persian Gulf in the east, and from the Taurus-Zagros arc in the north to the deserts of Saudi Arabia in the south. I do not have in mind a stock of clearly identifiable objects, such as handaxes, but a ubiquitous material, clay. It occurs on canal levees, in fields and is due to river sediments such as those of the Euphrates and Tigris (Wilkinson *et al.* 2015).

But I turn my sight here to an altered state of dry clay, its mixture with water to produce mud in various states of moisture. The plasticity of this material affords shaping, and the capacity of mud to turn into a solid by drying lends it a relatively long duration. This combination of clay and water affords the production of a host of things.

Interestingly, despite its easy accessibility, clay was not used intensively until the Natufian period, and even then to a very limited extent. Natufian-period people preferred to use bones, stones and probably wood to make the everyday objects they needed. In the subsequent Pre-Pottery Neolithic or PPN, we find a larger number of objects made of clay or clay-like materials, albeit still limited in frequency and variability. These include mainly small figurines of animals and humans (Rollefson 2008).

Mud affords shaping because of its plasticity. One might even ask why people did not recognize this capacity earlier, as the mixture of clay and water occurs without human interference. This reflection is typical for a lack of differentiation between general and canonical affordances. Mud affords shaping of all kinds of objects and was certainly sporadically formed into various things without necessarily leaving any archaeological traces. Only when the random encounter between humans and muddy matter took on greater frequency, other affordances emerged. I call these "derivative affordances" and list a few of them here.

- Erecting houses with flat roofs — the most common reconstruction for buildings from the Neolithic onwards for Mesopotamia — leads to the problem of leaks in rainy or snowy times of the year. Spreading thin layers of relatively impermeable clay on roofs before the winter is one of the most common methods to prevent this. Mud affords spreading, not only for roofs but also for floors, courtyards and wall coverings. Interestingly, spreadability is an affordance of gypsum and lime plaster which precede the use of mud (Kingery *et al.* 1975).
  From its beginning, the shaping of figurines often consists of an assembling of different parts. Separately made heads can be added to human torsos, tails or legs to animals or small knobs as indications of clothing. Mud affords additive processes, and among the best known are the Late Neolithic figurines from Sha'ar Hagolan (Garfinkel *et al.* 2010). Additivity as an affordance appears also in a completely different realm, the construction of buildings with pisé where layers of mud are piled on top of each other to form a whole.

- Mud affords impressions. In a discussion full of surprising insights and connections, Georges Didi-Huberman (2008) points out that impressions reach far back before the Neolithic. However, "impressionability" is a derivative affordance of the plasticity of mud. For early periods, stamp seals and their impressions come to mind (Akkermans and Duistermaat 1997; Duistermaat 2013; Bernbeck and Pollock 2021), and for later periods rolling of cylinder seals (Collon 1988). Academic prejudice rates another kind of impressions much higher: mud affords hand-forming into three-dimensional geometric shapes that can receive impressions. Up to this point, this can be considered one of the affordances of mud. The next step, the directed use of a stylus to inscribe/impress such geometric shapes in an orderly fashion with cuneiform signs, however, is no longer driven by direct perception except in one way: the sheer (material) process of producing wedge-shaped elements into clay surfaces depends on hand, moisture of the tablet and the shape, tip size and sharpness of the stylus used. However, the production of readable words cannot be described as a contingent encounter between words and human practice. Or the temporality of protention/retention. It needs a discursive consciousness. Here, an extreme narrowing down of the multifarious affordances of mud does not allow us to use this term. Non-randomness and the exclusion of direct perception are the principles on which writing and reading are based, even when it has turned into a routine.

- Clay and water also afford the opposite of impressing: the gesture of molding. Again, we find multiple examples from ancient Mesopotamia. The term "mudbrick" already implies this. Brickmaking, however, was not a simple, diachronically

stable technique (see Sauvage 1998). Molding was also used for the production of terracotta plaques, albeit with additional hardening by fire (Roßberger 2018). We would likely not even have imagined other affordances of mud, for example as a weapon. In 4th millennium BCE northern Mesopotamia, undried mud sling balls posed a very serious threat in violent encounters between social groups (Reichel 2006).

One may wonder why I did not mention so far the most ubiquitous objects made from mud: pottery. Ceramic objects are in need of a further step in their production, the hardening by fire. While firing can be used in connection with many other kinds of things I mentioned above, such as bricks, cuneiform tablets, figurines and sometimes even sealings, in those cases the hardening with fire does not turn into a necessary step.

CONCLUSION

In conclusion, I want to point out two issues that merit attention. My example of the mobilization of a clay-water mix in Mesopotamia has the disadvantage of considering only processes of making objects, not of using them. This raises the issue of the relation between derivative affordances, as I call them, and operational chains. The latter have been conceptualized and are generally as assumed to be governed by instrumentality, by a set goals and routine means to reach it. In some cases, (re)constructions of such chains include points where decisions have to be made (Lorenzon 2023). In contrast to the idea of decisions, the notion of "derivative affordance" focuses on contingent moments in processes of production. Such instances are due to the unforeseeability of small-scale encounters between matter and humans. In such processes, matter is both transformative and transformed. It plays an active role with an agency of its own, described sometimes as secondary agency (Gell 1998).

Another, more serious objection may be that affordance in general and even more so derivative affordances are too focused on individuals rather than communities or collectives. Alan Costall's "canonical" affordance idea is an attempt to obviate this problem. Canonization is the effect of a cultural agreement about how to carry out specific tasks that are learned; but not discursively, only in terms of a tacit knowledge, as Michael Polanyi (1966) called it. But his focus on canonization tips the balance of the encounter of humans and a non-human world in favor of the human side. However, collectives encounter a material world just as much as individuals, and both vary in their composition. For instance, buildings made of pies may be set on terrain of different slopes, closeness to water, quality of clay, the weather at the time of construction and many other factors. *Ceteris paribus* (or "all other things equal") is the academic way to distance oneself from affordance, a notion that tries to capture the multifarious relations in a dense network that has no static members or knots. Human collectives fit into this picture. Navigating a constantly changing network implies an ability to cope with dynamically shifting situations. In collectivities and communities, this is not simply an issue of (hierarchized) mastery. It is also a matter of minute variations of individual encounters within a collective that are not tied to differential levels of skill. Attention to affordances in archaeology helps us to question our own reconstructions of the emergence of hierarchies.

The direct perception vividly described in James Gibson's work, an insight into an active world in flux, has as its complement an *affordant* environment. James Gibson's reflections attempt to demonstrate that large parts of our world are neither driven by abstract intentions nor by discerning specifics of one's surroundings. Much of what is around us remains in the realm of *Beiläufigkeit* (see also Hahn 2015; Pollock *et al.* 2020). This sector of our lifeworld resists systematization, classification, instrumental thinking and thus those processes we consider to be good academic scholarship. My attempt to discuss some dimensions of affordance and direct perception likely falls prey to that paradox of systematizing the unsystematizable.

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REFERENCES

Akkermans, P.M.M.G. and Duistermaat, K., 1997. Of Storage and Nomads. The Sealings from Late Neolithic, Sabi Abyad, Syria', *Paléorient* 222, 17–44.

Appadurai, A., ed, 1986. *The Social Life of Things. Commodities in Cultural Perspective*. Cambridge: Cambridge University Press.

Arntz, M. and Lewis, M., eds., 2020. The chaîne opératoire: Past, Present and Future. *Archaeological Review from Cambridge* 35(1).

Belfer-Cohen, A. and Hovers, E., 2005. The Ground Stone Assemblages of the Natufian and Neolithic Societies in the Levant – A Brief Review'. *Journal of the Israel Prehistoric Society* 35, 299–308.

Bernbeck, R. and Pollock, S., 2021. Steps Toward a Long-Term History of Imprints. *In*: E. Kaiser, M. Meyer, S. Scharl and S. Suhrbier, eds. *Wissensschichten. Festschrift für Wolfram Schier zu seinem 65. Geburtstag*. Rahden/Westfalen: Verlag Marie Leidorf, 75–94.

Bourdieu, P., 1998. *Practical Reason. On the Theory of Action*. Stanford: Stanford University Press.

Collon, D., 1988. *First impressions: cylinder seals in the ancient Near East*. Chicago: University of Chicago Press.

Costall, A., 1995. Socializing Affordances. *Theory and Psychology* 5(4), 467–481.

Costall, A., 2012. Canonical Affordances in Context. *Avant* III(2), 87–93.

Deetz, J., 1967. *Invitation to Archaeology*. Garden City, NJ: Natural History Press.

Didi-Huberman, G., 2008. *La ressemblance par contact. Archéologie, anachronisme et modernité de l'empreinte*. Paris: Éditions de Minuit.

Dubreuil, L., 2004. Long-term trends in Natufian subsistence: a use-wear analysis of ground stone tools. *Journal of Archaeological Science* 31(11), 1613–1629.

Duistermaat, K., 2013. Private Matters. The Emergence of Sealing Practices in Neolithic Syria. *In*: O. Nieuwenhuyse, R. Bernbeck, P.M.M.G. Akkermans and J. Anvari, eds. *Interpreting the Late Neolithic of Upper Mesopotamia*. Turnhout: Brepols Publishers, 315–322.

Fisher, T.H., 2004. What We Touch, Touches Us: Materials, Affects, and Affordances. *Design Issues* 20(4), 20–31.

Garfinkel, Y., Ben-Shlomo, D. and Korn, N., 2010. *Shaar Hagolan Vol. 3. Symbolic Dimensions of the Yarmukian Culture: Canonization in Neolithic Art*. Jerusalem: Israel Exploration Society.

Gell, A., 1998. *Art and Agency – An Anthropological Theory*. Oxford: Oxford University Press.

Gibson, J.J., 1979. *The Ecological Approach to Visual Perception*. 1st edition. New York: Psychology Press.

Hahn, H.P., 2015. Der Eigensinn der Dinge – Einleitung. *In*: H.P. Hahn, ed. *Vom Eigensinn der Dinge. Für eine neue Perspektive auf die Welt des Materiellen*. Berlin: Neofelis Verlag, 9–56.

Haraway, D., 2007. *When Species Meet*. Minneapolis: University of Minnesota Press.

Hodgson, D., 2009. Symmetry and humans: reply to Mithens "Sexy Handaxe Theory". *Antiquity* 83(319), 195–198. https://doi.org/10.1017/S0003598X00098197

Hofmann, K.P. and Schreiber, S., 2011. Mit Lanzetten durch den practical turn? Zum Wechselspiel zwischen Mensch und Ding aus archäologischer Perspektive. *Ethnographisch-Archäologische Zeitschrift* 52(2), 163–187.

Ingold, T., 2000. *The Perception of the Environment. Essays on Livelihood, Dwelling and Skill*. London: Routledge.

Ingold, T., 2011. *Being Alive. Essays on Movement, Knowledge and Description*. London: Routledge.

Keane, W., 2018. Perspectives on Affordances, or the Anthropologically Real: The 2018 Daryll Forde Lecture. *HAU: Journal of Ethnographic Theory* 8(1–2), 27–38.

Key, A.J.M. and Lycett, S.J., 2017. Influence of Handaxe Size and Shape on Cutting Efficiency: A Large-Scale Experiment and Morphometric Analysis. *Journal of Archaeological Method and Theory* 24(2), 514–541. https://doi.org/10.1007/s10816-016-9276-0

Kingery, W.D., Vandiver, P.B. and Prickett, M., 1975. The Beginnings of Pyrotechnology, Part II: Production and Use of Lime and Gypsum Plaster in the Pre-Pottery Neolithic near East. *Journal of Field Archaeology* 2(1–2), 133–150. https://doi.org/10.2307/530304

Knappett, C., 2004. The Affordances of Things: a Post-Gibsonian Perspective on the Materiality of Mind and Matter. *In*: E. DeMarrais, C. Gosden and C. Renfrew, eds. *Rethinking Materiality: The Engagement of Mind with the Material World*. Cambridge: McDonald Institute Monographs, 43–51.

Koffka, K., 2009. *Zu den Grundlagen der Gestaltpsychologie: Ein Auswahlband*. Edited by M. Stadler. Vienna: Wolfgang Krammer.

Kohn, M. and Mithen, S., 1999. Handaxes: products of sexual selection? *Antiquity* 73(281), 518–526. https://doi.org/10.1017/S0003598X00065078

Koselleck, R., 1985. *Futures Past. on the Semantics of Historical Time*. Translated by K. Tribe. Cambridge, Mass.: MIT Press. https://doi.org/10.1017/S0003598X00083745

Lorenzon, M., 2023. Earthen Architecture as a Community of Practice: A Case Study of Neolithic Earthen Production in the Eastern Mediterranean. *Cambridge Archaeological Journal* 33(4), 601–618. https://doi.org/10.1017/S0959774323000033

Machin, A.J., 2008. Why handaxes just arent that sexy: A response to Kohn & Mithen (1999). *Antiquity* 82, 761–766. https://doi.org/10.1017/S0003598X00097362

McNabb, J., Cole, J. and Hoggard, C.S., 2018. From side to side: Symmetry in handaxes in the British Lower and Middle Palaeolithic. *Journal of Archaeological Science: Reports* 17, 293–310. https://doi.org/10.1016/j.jasrep.2017.11.008

Merleau-Ponty, M., 1945. *Phénoménologie de la perception*. Paris: Gallimard.

Müller, J. and Bernbeck, R., eds., 1996. *Prestige – Prestigegüter – Sozialstrukturen: Beispiele aus dem europäischen und vorderasiatischem Neolithikum*, Archäologische Berichte 6. Bonn: Holos.

Polanyi, M., 1966. *The Tacit Dimension*. New York: Doubleday & Co.

Pollock, S., Bernbeck, R., Appel, L., Loy, A.K. and Schreiber, S., 2020. Are All Things Created Equal? The Incidental in Archaeology. *Cambridge Archaeological Journal* 30(1), 141–149. https://doi.org/10.1017/S0959774319000489

Posnansky, M., 1959. Some Functional Considerations on the Handaxe. *Man* 59, 42. https://doi.org/10.2307/2796175

Reichel, C., 2006. Urbanism and Warfare: The 2005 Hamoukar, Syria, Excavations. *The Oriental Institute News and Notes* 189, 1–11.

Rietveld, E. and Kiverstein, J., 2014. A Rich Landscape of Affordances, *Ecological Psychology* 26(4), 325–352. https://doi.org/10.1080/10407413.2014.958035

Rollefson, G.O., 2008. Charming Lives: Human and Animal Figurines in the Late Epipaleolithic and Early Neolithic Periods in the Greater Levant and~Eastern Anatolia. *In*: J.-P. Bocquet-Appel and O. Bar-Yosef, eds. *The Neolithic Demographic Transition and its Consequences*. Dordrecht: Springer, 387–416.

Romeo, F., 2024. Cooperation, Law and Artificial Intelligence Technologies. *In*: F. Santoianni, G. Giannini and A. Ciasullo, eds. *Mind, Body, and Digital Brains,* Integrated Sience 20. Berlin: Springer, 253–263.

Roßberger, E., 2018. Refiguring the Body: From Terracotta Figurines to Plaques in Early Second Millennium Mesopotamia. *In*: M. Luciani, ed. *Images in Context: Agency, Audiences & Perception*. Wiesbaden: Harrasowitz, 523–538.

Sauvage, M., 1998. *La brique et sa mise en oeuvre en Mésopotamie*. Paris: Éditions Recherche sur les Civilisations.

Spikins, P., 2012. Goodwill hunting? Debates over the "meaning" of Lower Palaeolithic handaxe form revisited. *World Archaeology* 44(3), 378–392. https://doi.org/10.1080/00438243.2012.725889

Svrakic, D.M. and Zorumski, C.F., 2021. Neuroscience of Object Relations in Health and Disease: A Proposal for an Integrative Model. *Frontiers in Psychology* 2021. https://doi.org/10.3389/fpsyg.2021.583743

Wilkinson, T.J., Rayne, L. and Jotheri, J., 2015. Hydraulic landscapes in Mesopotamia: the role of human niche construction. *Water History* 7(4), 397–418. https://doi.org/10.1007/s12685-015-0127-9

Archaeology Looking Forward
Reconciling Our Expanded Knowledge with Our Assumptions

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KEYWORDS: *archaeological theory, deep history, institutions, middle-range theory, social mechanisms*

Abstract

Although numerous historical parallels in events are before us, rarely do we make systematic efforts to learn and extrapolate from past experiences to understand outcomes. To a degree, we are stymied by conceptual silos that cleave modernity from the deeper past and the West from the Rest. Here, we question these rigid divisions, which are rooted in nineteenth-century big theoretical constructs. Simultaneously, a tsunami of new data from archaeology and cognate disciplines has been found not to align or conform with these centuries-old theoretical ideas. We draw on these new findings to critique and offer modifications to entrenched, rather-static linear and over-generalized lenses on humanity's past. We advocate for a slight historical turn and a middle-range theoretical approach that remains explicitly comparative yet recognizes that human pasts took distinct, non-uniform paths to the present.

Zusammenfassung

Trotz der zahlreichen historischen Parallelen der Ereignisse vor unseren Augen bemühen wir uns nur selten systematisch darum, aus vergangenen Erfahrungen zu lernen und zu extrapolieren, um die Auswirkungen zu verstehen. Bis zu einem gewissen Grad werden wir durch konzeptionelle Silos behindert, die die Moderne von der tiefsten Vergangenheit und den Westen von den übrigen Ländern trennen. Hier stellen wir diese starren Trennungen in Frage, die in den großen theoretischen Konstrukten des neunzehnten Jahrhunderts verwurzelt sind. Gleichzeitig hat sich gezeigt, dass eine Flut neuer Daten aus der Archäologie und verwandten Disziplinen mit diesen jahrhundertealten theoretischen Vorstellungen unvereinbar ist. Wir stützen uns auf diese neuen Erkenntnisse, um festgefahrene, eher statische, lineare und übergeneralisierte Ansichten über die menschliche Vergangenheit zu kritisieren und Änderungen anzubieten. Wir plädieren für eine sanfte historische Wende und einen middle-range theoretischen Ansatz, der ausdrücklich vergleichend bleibt, aber anerkennt, dass die menschliche Vergangenheit unterschiedliche, ungleiche Wege in die Gegenwart genommen hat.

The New Gilded Age, wars along the Russian border, a global pandemic, battles for women's rights, the breakdown of sovereign institutions, even the reemergence of fascist rhetoric across the globe: history does rhyme with the present. Yet as former New York Times columnist Bob Herbert once observed: "*If history tells us anything, it's that we never learn from history*" (Herbert 2006). Why? What are the principal impediments that excise the past from efforts to inform the present and shape the future? And why and how would reframing a broader, yet more contextualized, lens on humanity's past help underpin a stronger foundation with greater depth and potential for analytical leverage and insight?

Drawing on recent historical events and policies, Bob Herbert's essay illustrates how often, in the face of emergent knowledge and changing circumstances, those who observe and absorb new information, stymied by inertia, fail to implement new courses of action; status quo remains in place, advantageous opportunities are missed, and the mistakes and missteps of the past recur. For the social sciences, and archaeology specifically, this warning seems prescient. On the one hand, empirically, a golden age has dawned (Buyalskaya *et al.* 2021) with a confluence of massive growth in empirical information, innovative new analytical methods, and encouraging prospects for novel cross-disciplinary collaborations. These trends are mirrored in archaeology where mid-twentieth-century shifts away from antiquarianism that coincided with greater investments in research fostered systematic regional surveys, broad horizontal excavations focused on meaningful, multiscalar units (from houses, settlements, regions, even to macroregions), and the incorporation of new interdisciplinary methods and techniques (*e.g.* Smith *et al.* 2012; Sinclair 2022).

And yet, despite the tsunami of new data, theoretical breakthroughs — truly disruptive science sparking conceptual innovation (Park *et al.* 2023) — have diminished across the social sciences, while theoretical agendas remain diffuse, not widely shared, especially for broad research issues that transcend traditional disciplines (*e.g.* Savage 2021). In archaeology, 40 years ago, Bruce Trigger (1984, 275) warned us of parallel trends, stultified academic frames that defined disparate agendas as masses of new empirical information remained insufficiently processed and digested to upend long-held tenets and propositions. Nevertheless, to a surprising degree, despite incredible technical and laboratory advances with revolutionary ramifications during the intervening years, adherence to long-held theoretical frameworks — cultural history and progressive cultural evolution with their embedded assumptions — remain basically as entrenched as they had been at the time of Trigger's prescient alert (Feinman 2023).

ARCHAEOLOGICAL FRAMEWORKS AND THEIR CONCEPTUAL BAGGAGE

From the early days of academic archaeology, more than a century and a half ago, two big ideas — progress and classification, both linked to nineteenth-century thought regarding the history of life — have underpinned archaeology's two principal paradigms, culture history and cultural evolution (Feinman and Neitzel 2020; Feinman 2023). Although these two frames, one particularizing and the other general, have often been critically juxtaposed, they have more recently been conceptually merged into the foundations of contemporary processual approaches in archaeology (Sahlins and Service 1960; Binford 1968). As the senior author recently has outlined (Feinman 2023), key expectations of this perspective, including the continuity, homogeneity, and closure of cultural traditions and general, linear, uniform paths of cultural/regional change, have not held up well in the face of recently collected data (see also Feinman and Neitzel 2020). Yet, equally problematic, given the propensity of contemporary archaeologists to draw their interpretations inductively from their data, are the tenets and assumptions embedded in culture history and cultural evolution, which often are applied and presumed in the context of analyzing archaeological data. Today, the 'stories' that archaeologists relate about the past often are as much a product of the assumptions made as the empirical data and facts on which they are based. In this context, our analytical 'common sense' or underlying tenets, many of which have been in place for more than a century, should not be retained or employed without scrutiny.

Both culture history and cultural evolution gained prominence during the nineteenth century in the context of improved transport and long-distance travel, heightened awareness of natural and cultural diversity, and increasing colonial encounters. These frames were designed to categorize and account for variability in human organizations. Timed with the growth of the North American academy, culture history and cultural evolution were cross-fertilized by biological thought (Feinman 2023). And yet, in the social sciences, early evolutionism initially was often misread as progress, stemming from a mischaracterization of biological evolution as the tree of life and biological species with human cultures or societies (Burnyeat and Sheild Johannsen 2022, 227). An unfortunate outgrowth of this cross-disciplinary borrowing was a reframing of how the history of organization and governance (Bevir 2012) was studied. Institutions evolved rather than were founded, such that the roles of agency, philosophy, and law in the history of human social cooperation were greatly diminished as causality shifted to external factors.

FALSE DICHOTOMIES: THE DENIAL OF AGENCY

The nineteenth-century theoretical currents that featured progress (evolution) and the classification of human diversity (culture history) were intertwined and closely associated with the emergent notions of modernity and 'the Enlightenment' during the second half of the second millennium CE in Europe (Robertson 1997). This era, defined by a postulated emergence of public rationality and liberal governance in the West, often then was contrasted in academic and more general contexts with a despotic (or less agentic) deeper past (Carneiro 1970). This dichotomy dovetailed with the influential division between anarchy and premodern civilization, central in the earlier writings of Thomas Hobbes (2003) and others (see Blanton and Fargher 2008, 6), which became a Eurocentric basis to view large-scale premodern polities (state and empires with the exception of Athens and Rome) as autocratic domains of absolute power (Marx 1964; Haas 1982).

From Thomas Hobbes' (2003) perspective, humans in their natural state are nasty, brutish, and self-absorbed, only tamed by the power and coercion of the state. While, clearly, humans, as a species, do have the capacity for great selfishness, we also are better cooperators with non-kin than any other animal (Melis and Semmann 2010; Blanton and Fargher 2016; Feinman 2023). This seeming paradox is explicable if we recognize that people are not by nature either uniformly cunning or cuddly, but rather humans, past and present, are capable of both cooperation and selfishness depending on the context. Our nature is not one-dimensional. Cooperative behavior is situational; we engage when an individual's wants dovetail with their larger social network or community. Lack of alignment short-circuits cooperation whether the network is large or small.

That first presumption undergirds another broadly held second one—that large premodern societies were universally coercive or despotic in organization. In alignment with the constructs of Thomas Hobbes (2003), autocratic governance was thought to keep the ever-selfish masses in line. This latter scenario has become the mid-twentieth-century justification for the walling off of modernity from the deeper past. If only after the Enlightenment could people organize themselves democratically, then how can the modern world learn from premodern history where the principles of organization were presumed to be so different? This false binary (Pocock 2005; Peters 2019) underlies the severing of deep history, especially non-Western pasts, from the present.

Breaking the analytical wall between modernity and the deeper past is not a denial of either the evident technological breakthroughs in transport, communication, and energy harvesting over recent centuries or a disavowal of the transition in global power differentials that mark the last centuries (Seth 2014). Rather, it is the necessity to decouple historical realities from Eurocentric notions (Blanton and Fargher 2016, 100–102; Graeber and Wengrow 2021) that those trends reflect inevitable progress or a magical advent of rational agency. If we are to leverage the full sweep of humanity's experience, with its known outcomes (Grant 2004), to discover, evaluate, and potentially eventuate paths to address and meet contemporary challenges, then we must acknowledge that humans have always been willful agents, but also have found cooperative affiliations, networks, and institutions to get things done collaboratively. In the next section, we propose revisions to conceptual tenets and frames that would broaden our analytical lens and better align how we theorize with what archaeologists and our colleagues have learned.

MODELING INTERPERSONAL INTERACTION

In his classic publication, Robert Carneiro (1970) juxtaposed the two main ways that interpersonal interactions are modeled in archaeology, voluntarism versus coercion, a dichotomy that remains entrenched to the present. The former is linked to more functionalist or systems approaches and presumes that people generally act for the good of the group as a whole, while the latter aligns with a more Marxist or Hobbesian stance that presumes selfishness and the logic of zero-sums. Robert Carneiro (*ibid.*) himself adopted the latter, rightly recognizing that people rarely consistently act for the good of the whole, eschewing their own self-interest. The focus on zero-sum, coercive social relations dovetails with Hobbesian, Marxist, and many neoevolutionary frames in which premodern social formations were necessarily despotic as the basis for maintaining order and sustaining "civilization."

For both the culture history approach, underpinned by the expectation that group members homogenously abide by cultural norms, and Marxian/neoevolutionary frames that model premodern social relations as top-down and coercive, the individual is presumptively envisioned as over-socialized, not afforded agency (Wrong 1961; Granovetter 1985). Each of these perspectives sees values and norms as proscribed from the top-down (whether by elders or despots). For

conceptualizing premodern worlds, the denial of subaltern agency is a serious limitation (Blanton and Fargher 2008; Feinman and Neitzel 2020), but so are assumptions that view individual agents as totally un-socialized, such as *Homo economicus*, guided solely by self-interest and maximization (Granovetter 1985; Blanton and Fargher 2016, 46). In this regard, we also take issue with Hobbesian notions that use 'anarchy' to describe human social niches before 'civilization.' Neither common meaning of anarchy, whether pure voluntarism or complete disorder, accord well with the social worlds of early members of our species. As Carneiro (1970) argued decades ago, people simply do not act voluntarily, unequivocally, or perpetually for the common good (Fehr *et al.* 2002). And yet, at the same time, there is emerging evidence that the social relations of our species were rarely totally chaotic or without order (Richerson and Boyd 2020; Tomasello 2020). Multiscalar social groupings and, even long-distance, networks, some enduring across generations, were central to the experience of *Homo sapiens*, as were periodic co-residence, cooperative labor, and even interpersonal inequalities (Hawkes 2020; Sterelny 2020). Yet, prior to the Holocene, such inequities were seemingly ephemeral, not institutionalized or long enduring (Feinman and Neitzel 2023).

To align with what we now know, humans should be modeled neither as un-socialized or as over-socialized. Rather, human sociality is situational, contingent, and diverse (*ibid.*), varying with the alignment of individual wants and needs with those of the larger community (Blanton and Fargher 2016). In social groupings and institutions, human relations take different forms, as do leader-follower relations, in the deep past (Singh and Glowacki 2022) and in more recent times (Ahlquist and Levi 2011). For this reason, if we are to understand how people responded to challenges and perturbations in the past, we must take into account how they were organized or governed themselves (Feinman 2023). We cannot continue to see the past as inhabited by dupes, dopes (Robin 2016), or automatons (Bregman 2019).

ANALYTICAL UNITS, INSTITUTIONS, AND VARIATION IN GOVERNANCE

Built on nineteenth-century conceptual foundations of categorization and progress, the lion's share of subsequent comparative archaeological theory has employed cultures or societies as the principal unit of long-term change. Yet both are seriously flawed for a slew of reasons. Cultural identities are not unidimensional and homogeneous, nor are they necessarily, or even often, coterminous with political behavior, action, or affiliation (Sökefeld 1999; Feinman and Neitzel 2020). As categorizations, the definition of specific cultures frequently is a direct remnant of static colonialist logics, and as practical units they do not align well with diachronic considerations of long-term change in other social science disciplines outside of anthropology/archaeology.

As analytical units, societies or polities should be considered as one relevant scale, yet their socio-spatial limits are not easily discerned archaeologically (Smith 2005; Smith 2007). Furthermore, focus on the whole structure of societies tends to promote closed-systems mechanical models in which change is presumed to occur in concert with an internal lifecycle or principle of development (Bondarenko 2020; Feinman 2023). In point of fact, our own findings in archaeology over the past decades have made it clear that changes in human social networks are not linear or progress-driven over time, are less uniform or generally directed from place to place, are marked by different tempos of change (*ibid.*), and are decidedly multiscalar (Kowalewski 2003; Mills *et al.* 2015; Feinman and Carballo 2022) composites of institutions that shift at alternative paces and directions, interrelating to undergird specific paths of change at larger spatial scales (Bondarenko 2020; Kowalewski and Birch 2020).

Over the last half century, many archaeologists have followed Kent Flannery's (1973; 1976) wise call and roadmap to examine the past in 'meaningful' units — houses, settlement layouts, public buildings, plazas, and other communal spaces and structures — rather than just test pits and trenches. In addition, systematic regional surveys have yielded a basis (at least in select parts of the globe) to define interactions between settlements. These research designs and the resultant findings provide an empirical basis to identify and investigate key regional institutions over time.

Institutions have been defined as "*organizations of people that carry out objectives using regularized practices and norms, labor and resources*" (Holland-Lulewicz *et al.* 2020, 1). They serve to link individuals to other people who have shared goals and objectives (Kowalewski and Birch 2020, 31). Human networks and communities, as well as larger sociopolitical affiliations, face key challenges known as the collective action problems — how to keep people working together for their individual and common good. Institutions, underpinned by norms and social compacts, are created to meet objectives and enhance survival in the face of landscapes dotted by social and natural trials and tribulations. What we refer to as societies are in actuality sets of institutions (Bondarenko 2020, 2), and

the interplay of articulating and changing institutions helps account for "the non-linear, alternative-pathways character of social evolution" (Kowalewski and Birch 2020, 31).

We have long known that the diversity and complexity of human institutions increase in accord with the scale of human affiliations (*e.g.* Ember 1963; Johnson and Earle 2000). But institutional scale and complexity does not fully account for institutional variation; different modes of interconnection, interaction, and integration also have a key role (Feinman 1995; Feinman 1998: Feinman 2011). For example, for the institutions of contemporary governance today, one writer (Bump 2022) has observed that the most critical dimension is the degree to which power is concentrated or distributed. Yet, given the long-held presumption that all premodern governance was coercive and predatory, it is only relatively recently (*e.g.* Renfrew 1974; Blanton *et al.* 1996) that this dimension has been systematically problematized for the premodern past with the recognition of premodern forms of collective governance (Blanton and Fargher 2008).

During the Holocene, when the scale of human social affiliations increased in size along with greater degrees of residential permanence (the establishment of larger, more sedentary communities in many regions), inequities in wealth and leadership often became institutionalized albeit in different ways to varying degrees (Feinman 1995; Feinman 2013). A key factor in the nature of leadership and the extent that power was concentrated was related to how specific institutions were fiscally financed (Blanton *et al.* 2021; Feinman and Neitzel 2023). To put it another way, specific institutions — built, funded, and maintained by individuals and groups — were responsible for setting the character of a particular form of governance (Holland-Lulewicz *et al.* 2022, 2). In certain contexts, keystone institutions can be identified; these are often articulated with constellations of other institutions, serving as a point of governance (Holland-Lulewicz *et al.* 2022).

For example, eight key institutions (states, cities, districts or neighborhoods, rural communities, marketplaces, temples, irrigation societies, and houses) have been broadly identified across precolonial Mesoamerica (Kowalewski and Heredia-Espinoza 2020), yet the articulation and relative importance of this institutional constellation varied markedly across space and time. The palace was a central, keystone institution in many Classic (250–900 CE) Maya cities, but other institutions, such as temples, apartment compounds, and even marketplaces served more pivotable roles in other precolonial Mesoamerican urban contexts (*ibid.*). The examination of institutions and how they were situated and articulated with other institutions and behavioral practices underpins comparative characterizations of variance in precolonial Mesoamerican governance (Feinman and Carballo 2018; Feinman and Carballo 2022; Carballo *et al.* 2025). In turn, this has allowed for the assessment of the differential responses and relative sustainability of these variably organized central places in the face of environmental and other challenges (Chase *et al.* 2023; Feinman *et al.* 2023). Such alternative organizational responses to similar perturbations are not unique to precolonial Mesoamerica (*e.g.* Scheffer *et al.* 2021; Molloy 2023); consideration of human interrelations and organization also is central to understanding vulnerabilities and the nature and degree of breakdown and collapse when faced with serious challenges and stressors (Blanton *et al.* 2020; Feinman *et al.* 2023).

If we are to leverage humanity's diverse histories as lessons for policy response, then we cannot treat premodern human social organization as a 'black box' (Leach 1973) or uniformly based on principles and exercises of coercion. As in the modern world, institutions and governance in the deeper past ranged in practices from personalized aggrandizement and self-serving exploitation on one hand to more collective intentions that were aimed at enhancing degrees of equity and well-being. In the remaining sections, we propose theoretical considerations that depart from problematic notions of historical linearity and uniformity yet do not preclude the use of humanity's histories through cross-cultural and diachronic comparisons.

SOCIAL MECHANISMS AND PATH DEPENDENCE

Over the last decades in archaeology, fine-grained comparative analyses between regions have recorded marked disparities in the tempos and the sequences of transition (*e.g.* Bandy 2008, Peterson and Drennan 2012; Feinman 2013; Feinman and Nicholas 2016). Now, with impressive increments in the quantity and quality of archaeological (and textual) data, we have no choice but to acknowledge that the human career did not follow a single linear course or even two distinct pathways, such as the West versus the Rest (*e.g.* Blanton and Fargher 2008). Across global regions, there is an ever-expanding record of political breakdowns and, at times, regenerations that do not follow a uniform or progressive path (Middleton 2017). We have arrived at a moment when it no longer makes sense to continue the centuries-long search for uniformities in humanity's past. At the same time, if our goal is to learn from history, we cannot abandon the need for careful comparative

analysis (*e.g.* Steinmetz 2014). Rather, we must find ways to harness comparisons to account for diversity in outcomes, sustainability, and practices that did or did not enhance well-being. To achieve such a comparative archive requires compiling and making sense of patterns, processes, and their relation to variable outcomes so that we can account for both similarities and differences as well as historical parallels and divergences. Setting that agenda necessitates reframing key preconceptions and tenets as we have outlined above, but also building comparative theory at a lower level of generality though the definition of middle-range theories constructed around the definition of social mechanisms (*e.g.* Hedström and Swedberg 1996).

If researchers recognize the unmet expectations of linear or uniform paths of historical change and eclipse the limitations of categorical or taxonomic societal stages (*e.g.* Service 1962; Fried 1967), in what ways do we look for explanation or probabilistic statements (*e.g.* ways to explicate diversity and change)? A seemingly productive focus is on somewhat lower levels of generality, what Robert Merton (1968) defined as middle-range theories (Smith 2011; Feinman and Nicholas 2016), which specifically drill down on the patterned relationships between key variables or social mechanisms (Hedström and Swedberg 1996) as a conceptual foundation to define historical parallels and underpin the processes that lead to similarities, differences, and change. Richard Blanton and Lane Fargher's (Blanton and Fargher 2008; Blanton and Fargher 2016; Blanton *et al.* 2020; Blanton *et al.* 2021; Blanton *et al.* 2022) comparative findings that the modes and degree of control over the fiscal financing of governance often underpinned the degree to which political power was concentrated and governance was instituted constitute a key mid-tier cross-cultural parallel (see also D'Altroy and Earle 1985; Levi 1988). The recurrently observed patterns associated with concepts of social scaling (Bettencourt 2013; Smith 2019), such that increasing demographic density and energized crowding tend to prompt higher levels of innovation and socioeconomic activity, represent another example where patterned relations help define institutional emergence. Demographic nucleation and the making of larger polities tend to be associated with greater levels of innovation, increased production, shifts in the practices and volumes of economic transfer, and new civic-ceremonial roles and identities (along with associated changes in ideologies and sanctification), but how these shifts specifically manifest and are articulated vary.

Social mechanisms are more probabilistic than determinative; nevertheless, they provide a means to account for variation as well as similarities (Gerring 2008, 178; Smith 2012a, 324). They also offer a basis to construct models of political action in relation to other factors that operate at multiple levels of analysis, integrating top-down and bottom-up causation, individuals, and institutions (*e.g.* Lewis and Steinmo 2010). In model building, heuristic efforts to account for higher levels of generality may be an attribute, but not when they persistently remain unconfirmed by the empirical record. To understand and explain variation along these dimensions requires conceptual frames that take into account how people were organized, when institutions were present, and how they were articulated. Such frames should also be more detailed, multidimensional, and less categorical than, for example, Elman Service's (1962) four typological stages of variation (Feinman 2012). Axes of diversity across human cooperative arrangements are far less consistent and uniform, yet potentially more explicable when analyzed through finer-grain lenses than past categorical schemes envisioned.

To this point we have stressed that how people organize themselves and the institutions through which they cooperate structure responses to perturbations and hazards, both natural and social, affecting sustainability (*e.g.* Barrios 2016; Latham and Layton 2019). "The relationships and processes that put social networks and communities on the map…shape the ways they are exposed to hazards, and their possibilities for recovery" (Barrios 2016, 28). To put it another way, the multiscalar footprint of a settlement or larger social field can either impinge on or enhance cooperation, and these conditions, including infrastructural elements, have an outsized role in shaping and constraining future practice and response (Mahoney 2000; Greener 2005). Nevertheless, although the past (and its structural elements) matters, it does not tightly cage what follows (Arroyo Abad and Maurer 2021). Shifts in institutions and their financing can shape responses and so the paths of subsequent change. In this sense, both mechanisms and the contexts in which they occur matter and are pertinent (Falleti and Lynch 2009). Neither is strictly determinative, and attention to context helps define how and why mechanisms lead to particular outcomes in specific historical settings. Joint consideration of mechanisms and context provide an analytical process to explore why mechanisms operating in distinct contexts may lead to different outcomes. It is important to distinguish this finer-grain approach from a more general focus on or consideration of cultures. Cultural units generally include a broad range of undifferentiated traits. Analytical considerations of cultures typically do not define and disaggregate those institutions and practices that are deemed relevant to particular mechanisms and episodes of change in ways that facilitate systematic, cross-time/space comparisons.

ARCHAEOLOGY LOOKING FORWARD

We began with the aim of using the deep reservoir of human history and experience as a basis to craft actions in the present with greater relevance for the future. Archaeological knowledge is one critical component of this endeavor, with history and other fields, as it offers the opportunity for a truly global record on the past, one not limited to contexts with documentary records, or just the Western classical tradition, or even post-colonial, more recent times. Rather, archaeological findings have the potential to span the globe, if we do not inadvertently destroy that material record first through development, climate change, and other destructive forces. In contrast to texts, archaeological findings have the potential to extend beyond those with wealth and power, the people who write history, to other social segments and everyday life (Sabloff 2019). Compared to early documentary histories, archaeology has the potential to vantage the past at multiple scales. Significantly, archaeological findings also offer a depth of time much longer than can be studied through written sources alone. Not only do such sequences afford the chance to see how differences and similarities emerged region to region, but we also can see how shifts in organization and governance in a specific context may be a crucial factor that underpins alternative outcomes.

Leveraging a comparative and synthetic record from archaeology, history, and related fields is not easy, although productive synthetic steps already have been taken (Blanton and Fargher 2008; Kohler and Smith 2018; Hoyer *et al.* 2023). Here, we have suggested steps to modify and reframe key tenets, assumptions, and considerations of analytical units that should facilitate cross-disciplinary, cross-cultural, and cross-temporal comparisons in ways that allow for the assessment and evaluation of outcomes. Human social relations and networks were generally open, changeable over time and across space, not always top-down, rarely transformational, and reflective of the fact that people have always had agency.

The recognition of these realities is a key corrective to the presumed stasis of cultural categorization and notions of unilinear progress embedded in the legacies of nineteenth-century theory. At the same time, we realize that by advocating the incorporation of human social relations into considerations of response to perturbations and long-term change, analytical frames that we employ will sacrifice some generality. Yet we also strongly suspect that by not treating human behavior as a black box, the proposed comparative constructs will gain a higher degree of realism, an equally important attribute of conceptual model building and causal assessment (Levins 2006; Feinman 2023). In the historical sciences, the tweaking of theoretical constructs and modifications of assumptions in the face of new empirical evidence is neither rare nor unexpected (Mayr 1982; Wolf 1999, 22; McFall-Ngai 2022). The modification and growth of ideas from extant foundations represents a necessary rethinking, not a wholesale paradigm shift (*e.g.* Pigliucci 2006).

We are cognizant that the reframing that we propose constitutes a bit of a 'historical turn' (Capoccia and Ziblatt 2010). This accords with the realization that "the social sciences themselves are historical disciplines" (Mills 2000, 146). And so, while we question the universalities regarding the linearity, directionality, specific sequences, and tempos of change, we do not dispute the value and essentiality of cross-case comparison or the recognition that there are clear patterns and trends in the ways that humans organize themselves (*e.g.* Granovetter 1973; Dunbar 2011; Bettencourt 2013; Dunbar and Sossis 2018; Feinman and Neitzel 2023) and how specific formations respond to comparable challenges and perturbations. In our sense, a historical turn implies that the analyst looks in-depth at historical episodes in which institutions were created, reshaped, or responded to challenges, but with a close eye on outcomes and their broader comparative implications.

In sum, we advocate a more forward-looking approach to archaeological analysis and interpretation. The perspective we envision neither projects back colonialist cultural categories (Lekson 2018, 6–26) nor looks back from the present to stepped ladders of progressive change or branches modeled from the 'tree of life.' Rather, it examines and compares the long sweep of global histories (both forward and back), microregion to microregion, region to region, examining the processes of change and contrasting outcomes across long temporal episodes (Axtell 1979, 5). By actually peopling the past its relevance is broadened, the potential lessons are sharpened, for the present and the future. "*The social world was made by men*" [people] [...] "*and therefore, can be remade by them*" (Berger and Luckmann 1991, 89).

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REFERENCES

Ahlquist, J.L. and Levi, M., 2011. Leadership: what it means, what it does, and what we want to know about it. *Annual Review of Political Science* 14, 1–24.

Arroyo Abad, L. and Maurer Jr., N., 2021. History never really says goodbye: a critical review of persistence literature. *Journal of Historical Political Economy* 1, 31–68.

Axtell, J., 1979. Ethnohistory: an historian's viewpoint. *Ethnohistory* 26, 1–13.

Bandy, M., 2008. Global patterns of early village developments. *In:* J.P. Bocquet-Appel and O. Bar-Yosef, eds. *The Neolithic demographic transition and its consequences*. Berlin*:* Springer, 333–357.

Barrios, R.E., 2016. Resilience: a commentary from the vantage point of anthropology. *Annals of Anthropological Practice* 40, 28–38.

Berger, P. and Luckmann, T., 1991. *The social construction of reality: a treatise in the sociology of knowledge*. London: Penguin.

Bettencourt, L.M.A., 2013. The origins of scaling in cities. *Science* 340, 1438–1441.

Bevir, M., 2012. *Governance: a very short introduction*. Oxford, UK: Oxford University Press.

Binford, L.R., 1968. Some comments on historical versus processual archaeology. *Southwestern Journal of Anthropology* 24, 267–275.

Blanton, R. and Fargher, L., 2008. *Collective action in the formation of pre-modern states*. New York: Springer.

Blanton, R.E. and Fargher, L.F., 2016. *How humans cooperate: confronting the challenges of collective action*. Boulder: University Press of Colorado.

Blanton, R.E., Feinman, G.M., Kowalewski, S.A., Peregrine, P.N., 1996. A dual-processual theory for the evolution of Mesoamerican civilization. *Current Anthropology* 37, 1–44.

Blanton, R.E., Feinman, G.M., Kowalewski, S.A. and Fargher, L.F., 2020. Moral collapse and state failure: a view from the past. *Frontiers in Political Science* 2, 568704.

Blanton, R.E., Fargher, L.F., Feinman, G.M. and Kowalewski, S.A., 2021. The fiscal economy of good governance past and present. *Current Anthropology* 62, 77–100.

Bondarenko, D.M., 2020. Introduction. *In: Bondarenko et al. 2020*, 1–25.

Bondarenko, D.M., Kowalewski, S.A. and Small, D.B., eds., 2020. *The evolution of social institutions: interdisciplinary perspectives*. Cham, Switzerland: Springer.

Bregman, R., 2019. *Humankind: a hopeful history*. New York: Little Brown.

Bulyalskaya, A., Gallo, M., Camerer, C.F., 2021. The golden age of social science. *Proceedings of the National Academy of Sciences*, 118(5), e2002923118.

Bump, P., 2022. The newly important American political axis: democracy vs. autocracy. *Washington Post*, March 18, 2022.

Burnyeat, G. and Sheild Johannsen, M., 2022. An anthropology of the social contract: the political power of an idea. *Critical Anthropology* 42, 221–237.

Capoccia, G. and Ziblatt, D., 2010. The historical turn in democratization studies: a new research agenda for Europe and beyond. *Comparative Political Studies* 43, 931–968.

Carballo, D.M., Feinman, G.M. and López Corral, A., 2025. Mesoamerican urbanism: indigenous institutions, infrastructure, and resilience. *Urban Studies* 62(3), 507–524.

Carneiro, R.L., 1970. A theory of the origin of the state: traditional theories of state origins are considered and rejected in favor of a new ecological hypothesis. *Science* 169, 733–738.

Chase, D.Z., Lobo, J., Feinman, G.M., Carballo, D.M., Chase, A.F., Chase, A.S.Z., Hutson, S.R., Ossa, A., Canuto, M., Stanton, T.W., Gorenflo, L.J., Pool, C.A., Arroyo, B., Liendo Stuardo, R. and Nichols, D.L., 2023. Mesoamerican urbanism revisited: environmental change, adaptation, resilience, persistence, and collapse. *Proceedings of the National Academy of Sciences* 120(31), e2211558120.

D'Altroy, T.N. and Earle, T.K., 1985. Staple finance, wealth finance, and storage in the Inca political economy. *Current Anthropology* 26, 187–197.

Dunbar, R.I.M., 2011. Constraints on the evolution of social institutions and their implications for information flow. *Journal of Institutional Economics* 7, 345–371.

Dunbar, R.I.M. and Sossis, R., 2018. Optimizing human community sizes. *Evolution and Human Behavior* 39, 106–111.

Ember, M. 1963. The relationship between economic and political development in nonindustrialized societies. *Ethnology* 2, 228–248.

Falleti, T.G. and Lynch, J.F., 2009. Context and causal mechanisms in political analysis. *Comparative Political Studies* 42, 1143–1166.

Fehr, E., Fischbacher, U. and Gächter, S., 2002. Strong reciprocity, human cooperation, and the enforcement of social norms. *Human Nature* 13, 1–25.

Feinman, G.M., 1995. The emergence of inequality: a focus on strategies and process. *In:* T.D. Price and G.M. Feinman, eds. *Foundations of social inequality*. New York: Plenum, 255–279.

Feinman, G.M., 1998. Scale and social organization: perspectives on the archaic state. *In:* G.M. Feinman and J. Marcus, eds. *Archaic states*. Santa Fe, NM: School of American Research Press, 95–133.

Feinman, G.M., 2011. Size, complexity, and organizational variation: a comparative approach. *Cross-Cultural Research* 45, 37–58.

Feinman, G.M., 2012. Comparative frames for the diachronic analysis of complex societies: next steps. *In: Smith 2012b*, 21–43.

Feinman, G.M., 2013. The emergence of social complexity: why more than population size matters. *In:* D.M. Carballo, ed. *Cooperation and collective action: archaeological perspectives*. Boulder: University Press of Colorado, 35–56.

Feinman, G.M., 2023. Reconceptualizing archaeological perspectives on long-term political change. *Annual Review of Anthropology* 52, 347–364.

Feinman, G.M. and Carballo, D.M., 2018. Collaborative and competitive strategies in the variability and resiliency of large-scale societies in Mesoamerica. *Economic Anthropology* 5, 7–19.

Feinman, G.M. and Carballo, D.M., 2022. Communication, computation, and governance: a multiscalar vantage on the prehispanic Mesoamerican world. *Journal of Social Computing* 3, 91–118.

Feinman, G.M., and Neitzel, J.E., 2020. Excising culture history from contemporary archaeology. *Journal of Anthropological Archaeology* 60, 101230.

Feinman, G.M., and Neitzel, J.E., 2023. The social dynamics of settling down. *Journal of Anthropological Archaeology* 69, 101468.

Feinman, G.M. and Nicholas, L.M., 2016. Framing the rise and variability of past complex societies. *In:* L.F. Fargher and V.Y. Heredia-Espinoza, eds. *Alternative pathways to complexity: a collection of essays on architecture, economics, power, and cross-cultural analysis*. Boulder: University Press of Colorado, 271–289.

Feinman, G.M., Carballo, D.M., Nicholas, L.M. and Kowalewski, S.A., 2023. Sustainability and duration of early central places in prehispanic Mesoamerica. *Frontiers in Ecology and Evolution* 11, 1076740.

Flannery, K.V., 1973. Archaeology with a capital "S". *In:* C.L. Redman, ed. *Research and theory in current archaeology*. New York: John Wiley & Sons, 47–53.

Flannery, K.V., ed., 1976. *The early Mesoamerican village*. New York: Academic.

Fried, M.H., 1967. *The evolution of political society: an essay in political anthropology*. New York: Random House.

Gerring, J., 2008. The mechanistic worldview: thinking inside the box. *British Journal of Political Science* 38, 161–179.

Graeber, D. and Wengrow, D., 2021. *The dawn of everything: a new history of humanity*. New York: Picador.

Granovetter, M.S., 1973. The strength of weak ties. *American Journal of Sociology* 78, 1360–1380.

Granovetter, M.S., 1985. Economic action and social structure: the problem of embeddedness. *American Journal of Sociology* 91, 481–510.

Grant, J., 2004. Sustainable urbanism in historical perspective. *In:* A. Sorensen, P.J. Marcotullio and J. Grant, eds. *Towards sustainable cities: East Asian, North American, and European perspectives on managing global regions*. Hampshire, UK: Ashgate, 24–37.

Greener, I., 2005. The potential of path dependence in political studies. *Politics* 25, 62–72.

Haas, J., 1982. *The evolution of the prehistoric state*. New York: Columbia University Press.

Hawkes, K., 2020. Cognitive consequences of our grandmothering life history: cultural learning begins in infancy. *Philosophical Transactions of the Royal Society B* 375 (1803), 20190501.

Hedström, P. and Swedberg, R., 1996. Social mechanisms. *Acta Sociologica* 39, 281–308.

Herbert, B., 2006. Lessons never learned. *The New York Times*, December 28, 2006. https://www.nytimes.com/2006/12/28/opinion/28herbert.html ; last access 1st August 2025.

Hobbes, T., 2003. *Leviathan*. Bristol: Thoemmes Continuum.

Holland-Lulewicz, J., Conger, M.A., Birch, J., Kowalewski, S.A. and Jones, T.W., 2020. An institutional approach for archaeology. *Journal of Anthropological Archaeology* 58, 101163.

Holland-Lulewicz, J., Thompson, V.D., Birch, J. and Grier, C., 2022. Keystone institutions of democratic governance across Indigenous America. *Frontiers in Political Science* 4, 840049.

Hoyer, D., Bennett, J.S., Reddish, J., Holder, S., Howard, R., Benam, M., Levine, J., Ludlow, F., Feinman, G. and Turchin, P., 2023. Navigating polycrisis: long-run, socio-cultural factors shape response to changing climate. *Philosophical Transactions of the Royal Society B* 378(1889), 20220402.

Johnson, A.W. and Earle, T., 2000. *The evolution of human societies: from foraging group to agrarian state*, 2nd edition. Stanford, CA: Stanford University Press.

Kohler, T.A. and Smith, M.E., eds., 2018. *Ten thousand years of inequality: the archaeology of wealth differences*. Tucson: University of Arizona Press.

Kowalewski, S.A., 2003. Scale and demographic change: 3,500 years in the Valley of Oaxaca. *American Anthropologist* 105, 313–325.

Kowalewski, S.A. and Birch, J., 2020. How do people get big things done. *In: Bondarenko et al. 2020*, 29–50.

Kowalewski, S.A. and Heredia-Espinoza, V.Y., 2020. Mesoamerica as an assemblage of institutions. *In: Bondarenko et al. 2020*, 495–522.

Latham, A. and Layton, J., 2019. Social structure and the public life of cities: studying urban sociality and public spaces. *Geography Compass* 13, 124–144.

Leach, E., 1973. Concluding address. *In:* C. Renfrew, ed. *The explanation of culture change: models in prehistory*. Gloucester Crescent, UK: Duckworth, 761–771.

Lekson, S.H., 2018. *A study of Southwestern archaeology*. Salt Lake City: University of Utah Press.

Levi, M., 1988. *Of rule and revenue*. Berkeley: University of California Press.

Levins, R., 2006. Strategies of abstraction. *Biology and Philosophy* 21, 741–755.

Lewis, O. and Steinmo, S., 2010. Taking evolution seriously in political science. *Theory in Biosciences* 129, 235–245.

Mahoney, J., 2000. Path dependency in historical sociology. *Theory and Society* 29, 507–548.

Marx, K., 1964. *Pre-capitalist economic formations*. London: Lawrence & Wishart.

Mayr, E., 1982. *The growth of biological thought: diversity, evolution, and inheritance*. Cambridge, MA: Harvard University Press.

McFall-Ngai, M., 2022. Building a career during a revolution in biology. *Nature Microbiology* 7, 347–348.

Melis, A. and Semmann, D., 2010. How is human cooperation different? *Philosophical Transactions of the Royal Society* B 365, 2663–2674.

Merton, R.K., 1968. *Social theory and social structure*, 3rd edition. New York: Free Press.

Middleton, G.D., 2017. *Understanding collapse: ancient history and modern myth*. Cambridge, UK: Cambridge University Press.

Mills, C.W. 2000. *The sociological imagination*. Oxford, UK: Oxford University Press.

Mills, B.J., Peeples, M.A., Haas Jr., W.R., Borck, L., Clark, J.J. and Roberts Jr., J.M., 2015. Multiscalar perspectives on social networks in the late prehispanic Southwest. A*merican Antiquity* 80, 3–24.

Molloy, B., 2023. Was there a 3.2 ka crisis in Europe? A critical comparison of climatic, environmental, and archaeological evidence for radical change during the Bronze Age-Iron Age transition. *Journal of Archaeological Research* 31, 331–394.

Park, M., Leahey, E. and Funk, R.J., 2023. Papers and patents are becoming less disruptive over time. *Nature* 613, 138–144.

Peters, M.A., 2019. The enlightenment and its critics. *Educational Philosophy and Theory* 51, 886–894.

Peterson, C.E. and Drennan, R.D., 2012. Patterned variation in regional trajectories of community growth. *In: Smith 2012b*, 88–137.

Pigliucci, M., 2006. Evolutionary biology: puzzle solving of paradigm shifting? *The Quarterly Review of Biology* 81, 377–379.

Pocock, J.G.A., 2005. Historiography and enlightenment: a view from their history. *Modern Intellectual History* 5, 83–96.

Renfrew, C., 1974. Beyond a subsistence economy: the evolution of social organization in prehistoric Europe. *In:* C.B. Moore, ed. *Reconstructing complex societies: an archaeological colloquium*. Cambridge, MA: Bulletin of the American School of Oriental Research, 69–95.

Richerson, P.J. and Boyd, R., 2020. The human life history is adapted to exploit the adaptive advantages of culture. *Philosophical Transactions of the Royal Society* B 375(1553), 20190498.

Robertson, J., 1997. The enlightenment above national context: political economy in eighteenth-century Scotland and Naples. *The Historical Journal* 40, 667–697.

Robin, C., 2016. Neither dupes nor dopes: Maya farmers and ideology. *Ancient Mesoamerica* 27, 221–230.

Sabloff, J.A., 2019. How Maya archaeologists discovered the 99% through the study of settlement patterns. *Annual Review of Anthropology* 48, 1–16.

Sahlins, M.D. and Service, E.R., eds., 1960. *Evolution and culture*. Ann Arbor: University of Michigan Press.

Savage, M., 2021. *The return of inequality: social change and the weight of the past*. Cambridge, MA: Harvard University Press.

Scheffer, M., van Nes, E.H., Bird, D., Bocinsky, R.K. and Kohler, T.A., 2021. Loss of resilience preceded transformations of pre-Hispanic Pueblo societies. *Proceedings of the National Academy of Sciences* 118, e2024397118.

Service, E.R., 1962. *Primitive social organization: an evolutionary perspective*. New York: Random House.

Seth, S., 2014. The politics of knowledge: or, how to stop being Eurocentric. *History Compass* 12, 311–320.

Sinclair, A., 2022. Archaeological research 2014 to 2021: an examination of its intellectual base, collaborative networks, and conceptual language using science maps. *Internet Archaeology* 59. https://doi.org/10.11141/ia.59.10

Singh, M. and Glowacki, L., 2022. Human social organization during the Late Pleistocene: beyond the nomadic-egalitarian model. *Evolution and Human Behavior* 43, 418–431.

Smith, M.E., 2011. Empirical urban theory for archaeologists. *Journal of Archaeological Method and Theory* 18, 167–192.

Smith, M.E., 2012a. Archaeology, early complex societies, and comparative social science history. *In: Smith 2012b*, 321–329.

Smith 2012b: Smith, M.E., ed. *The comparative archaeology of complex societies*. Cambridge, UK: Cambridge University Press.

Smith, M.E., 2019. Energized crowding and the generative role of settlement, aggregation and urbanization. *In:* A. Gyucha, ed. *Coming together: comparative approaches in population aggregation and early urbanization*. Albany: State University of New York Press, 37–58.

Smith, M.E., Feinman, G.M., Drennan, R.D., Earle, T., and Morris, I. 2012. Archaeology as a social science. *Proceedings of the National Academy of Sciences* 109, 7617–7621.

Smith, M.L., 2005. Networks, territories, and the cartographies of ancient states. *Annals of the American Association of Geographers* 95, 832–849.

Smith, M.L., 2007. Territories, corridors, and networks: a biological model for the premodern state. *Complexity* 12, 28–35.

Sökefeld, M., 1999. Debating self, identity, and culture in anthropology. *Current Anthropology* 40, 417–448.

Steinmetz, G., 2014. Comparative history and its critics: a genealogy and a possible solution. *In:* P. Duara, V. Murthy and A. Sartori, eds. *A companion to global historical thought*. West Sussex, UK: Wiley, 412–436.

Sterelny, K., 2020. Innovation, life history and social networks in human evolution. *Philosophical Transactions of the Royal Society* B 375(1803), 20190497.

Tomasello, M., 2020. The adaptive origins of uniquely human sociality. *Philosophical Transactions of the Royal Society* B 375(1803), 20190493.

Trigger, B.G., 1984. Archaeology at the crossroads: what's new? *Annual Review of Anthropology* 13, 275–300.

Wolf, E.R., 1999. *Envisioning power: ideologies of dominance and crisis*. Berkeley: University of California Press.

Wrong, D.H., 1961. The oversocialized conception of man in modern sociology. *American Sociological Review* 26, 183–193.

Materiality. Utility. Common Good – Towards a Kiel Definition of Resources

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KEYWORDS: *economic archaeology, resources in archaeology, economic history, resources in history, ROOTS*

Abstract

There is no consensus on what resources are. After a brief overview of common definitions, we — a working group within the ROOTS Cluster of Excellence — try to find a pragmatic definition. To this end, we analyse properties of resources that are studied within ROOTS and use them to classify the resources themselves in a cluster analysis.

While in the past all resources had to be evaluated in their context and thus always relatively, this is likely to change in the near future: We are approaching the absolute limits of available resources that describe the human niche.

Zusammenfassung

Es besteht kein Konsens darüber, was Ressourcen sind. Nach einem kurzen Überblick über gängige Definitionen versuchen wir — eine Arbeitsgruppe innerhalb des Exzellenzclusters ROOTS — eine pragmatische Definition zu finden. Zu diesem Zweck untersuchen wir Eigenschaften von Ressourcen, die im Rahmen von ROOTS diskutiert werden, und nutzen diese, um die Ressourcen selbst mit Hilfe einer Clusteranalyse zu klassifizieren.

Während in der Vergangenheit alle Ressourcen in ihrem Kontext und damit immer relativ bewertet werden mussten, wird sich dies in naher Zukunft wahrscheinlich ändern: Wir nähern uns den absoluten Grenzen der Verfügbarkeit von Ressourcen, die die menschliche Nische beschreiben.

Resources are the elements of economic action.[1] The scarcity of resources gives rise to the allocation problem (Max Weber's generic "economic problem"), which can only be brought closer to a solution through economic activity: In a world of unlimited resources, the use of resources would be equal, fair and sustainable. The world we live in is characterised by different levels of access to resources — we experience natural and social inequalities. A large part of economic theory seeks to optimise ways of distribution and ways to allocate goods to maximise individual or total utility, respectively. In organisational units and networks, the mechanisms for the allocation of resources are crucial for the efficient functioning of community. However, in this context, it is always open what exactly is understood by utility as well as resources, who can use them when, and in what way the sustainability of their use is operationalised. Here, we attempt to distil a Kiel concept of resources from the practice of this very research, being conducted collaboratively within the ROOTS Cluster of Excellence at Kiel University.

1 As an organiser of science in the competitive field of interdisciplinary research, the jubilarian understood well how to ensure the continuous acquisition and the profitable allocation of the resources necessary for joint success in larger organisational units. Not only, but also for this, the authors would like to express their sincere thanks to Johannes — *ad multos annos*!

In a first approximation, one can understand resources as natural reserves and as those means that are used individually and/or socially to achieve individual or social goals. Those goals are what is called utility.

Scarcity — usually axiomatically assumed in economics to correspond to an unlimited increase in needs — is not necessarily part of the definition. However, without scarcity, resources are not resources in the sense of the aforementioned economics. The fact that non-scarce resources can nevertheless be meaningfully regarded as resources in the sense of the given definition has been claimed to be an important lesson of economic anthropology (Rössler 1999, 19–24). This also has implications for archaeology: When, in archaeology, resources are modelled economically, their scarcity must first be proven (Kerig 2013) — a look at the settlement density in prehistoric landscapes often far below any carrying capacity makes this clear for a factor land, for example.

Most basic economic and sociological definitions underline the material background of the term "resources", indicating their countable or concrete nature, such as land, water, forest and timber, and energy, or more specific, sorts of materials such as metals and minerals, certain liquids and even gases. However, the etymological background of the term 'resource' lies in Latin "*resurgere*" ("to rise again") and came to English via French where it meant restoration or literally a new spring.[2] Over time, the term evolved to refer to anything that can be used to meet a need or achieve a purpose, particularly in the context of economics and natural resource management.

In recent studies into environmental ethics and on sustainability, a strong position was developed by Konrad Ott (2014, building on Rawls 1972) which uses the term 'nature capital' for some kinds of resources. This position from ecological economics highlights the shortcoming of conventional economics where natural resources, which include geology, soils, air, water and all living organisms, are frequently considered as unlimited externalities always available as inputs and sinks of human resource acquisition and discard (Daly 1996). Despite being difficult to calculate, they need to be considered to genuinely develop sustainable perspectives of resource utilisation (Ott and Döring 2008).

For a modern analytical understanding of resources and the ability to utilise the term 'resource' in our research context, it is important to understand its historic dimension as well as the diverse features of its use (Bridge 2001; Bender 2003). Most economic definitions distinguish various spheres of resources that correspond to the inputs or production factors of the classical economy (land, labour, capital):

1. Natural resources: Classically referred to as land or soil (abbr. S), these are the raw materials and all other gifts of nature that are used in production, such as land, water, minerals, forests, and energy sources.
2. Human resources: Also known as labour (abbr. L), human resources refer to the physical and mental efforts exerted by individuals in the production process. This includes both the skills and abilities of workers, as well as their time and effort devoted to producing goods and services. It must be mentioned that the Karl Marx-inspired labour theory of value, which has found some application in archaeology, knows neither land nor capital, but calculates both as mediated by labour (Kerig 2013).
3. Capital resources: These resources consist of the man-made goods that are used in the production process to create other goods and services. Capital (abbr. K) arises from the renunciation of consumption. This includes physical capital such as machinery, equipment, buildings, and infrastructure, as well as financial capital such as money and investments. Infrastructure measures that are accumulated in the landscape over time, like turning woodland into arable fields, terracing, and building roads, can also be counted as capital. In principle, any form of deep time human impact and environmental pollution (as anthropogenically deposited and often accumulated material) affects natural resources. This becomes clear when looking at arable land that can no longer be used due to ancient heavy metal accumulations — or just the opposite: another example is *terra preta* (pretic anthrosol), the fertile dark tropic anthrosol, which is a famous representative of anthropogenic dark earths characterised by high black carbon contents and settlement waste as well as significantly increased soil fertility (Schneeweiß 2022).
4. Cognitive, social and psychological resources are traditionally subsumed under labour, but sometimes entrepreneurial abilities are seen as a special kind of resource: Some see individual freedom, the field of human capabilities, which encompasses skills, personal traits, and often especially a mental attitude as political and / or economic con-

2 Digitales Wörterbuch der deutschen Sprache: https://www.dwds.de/wb/Ressource, Oxford English Dictionary: https://www.oed.com/dictionary/resource_n?tl=true#25663900 ; last access 13th May 2024

straints of production and innovation, as part of a special ability to organise land, labour and capital into a profitable enterprise. Such a view ultimately distinguishes between the characteristics of entrepreneurs and those of employees. Labour is contrasted with a special aptitude for entrepreneur- and/or leadership. The role of entrepreneurship remains unclear for pre-modern and / or non-capitalistic economies.

5. Outputs or yields (abbr. Y) are often defined as a combination of technology (abbr. T) with the factors of production (S, L, K). In a historical perspective, technology itself or rather the state of the development of technology could be seen as a resource (Kerig 2013). It would then be the state of technical development that would be available as knowledge, but whose application would depend on the availability of other resources. This does not differ in principle from the conditions of applicability of other resources.

However, these spheres of resources can be enhanced to contribute to research on sustainable resource utilisation. As a result, the concept of resources initially loses some of its usual economic meaning, but it is precisely this that enables a broader discussion within the humanities. An example is the approach to qualify aesthetics and architectural perceptions as intangible resources through the analysis of the financial means consumed in medieval cities (Schwedler and Němec 2021). Urban structures and infrastructures constitute a sustained utilisation of material and human resources. This fits to Amartya Sen's capability approach with resources as the means for human ends of engaging in valued ways of doing and being. In archaeology, this idea has been recently adapted in investigations into resource and capital distributions, the effects of these in expanding or depriving capabilities including consequences for socio-cultural continuity and transformation (Arponen *et al.* 2024).

That the results of such discussions later may flow back into economic thinking — and that means into the economists' calculations — is due to the above-mentioned openness of the term utility. By discussing resources, actually the societal meaning of utility is discussed. Above all, it is important to reflect on theory-oriented as well as application-oriented conceptions of the usage of the term resource. The aim is to initiate more integrative research on resources, which are situated at the intersections of natural, technical, social, and human sciences and include conceptions of "resources" beyond natural, human or financial means.

This brief list already shows how difficult it is to arrive at a uniform concept of resources. On the one hand, the listed resources can be understood as production factors (S, L, K) or all of them can be merely subsumed under the production factor of labour. On the other hand, the concept can be applied more widely and, again, less sharply, for example, to the prerequisites for individual psychological resilience. A perspective on knowledge as a resource makes this immediately clear. It is acquired individually, it is maintained institutionally (in families, schools, temples and monasteries, libraries and data bases), it is passed on from generation to generation (in stories and in songs, written or in YouTube-tutorials), sometimes as a workshop secret, arcanum or as a religious truth, and it changes as it is passed on. In prehistoric societies, we have learnt in recent years that knowledge about secret or remote resources can be accumulated and used to achieve certain goals. In Neolithic societies, in particular, status and prestige appear to be closely linked to the perhaps esoteric knowledge of their origins (*e.g.* UK: Barrowclough 2010, 75–104; Theather *et al.* 2019). There is hardly any other explanation for the distribution of raw materials from marginal areas such as Langdale (Bradley and Edmonds 1993; Edinborough *et al.* 2020) or of exceptional jade/jadeit axe blades (JADE 2), or of the deep red Heligoland flint, which attracted the interest of Johannes Müller (2014) — all those materials come from extremely remote areas of origin. Social knowledge about the accessibility of these raw materials, *i.e.*, about routes, exchange partners and means of communication, can be assumed (Midgley 2013; Kerig 2018). Something similar has long been claimed for early metallurgy (Kerig accepted). Here too, practical, most likely social, probably magical knowledge was not available to everyone.

It has become evident from the collaboration of natural sciences and the different humanities that there is no overall encompassing perspective to define resources. Anke Scholz *et al.* (2017) state that "resources are defined as the tangible and intangible means by which actors create, sustain or alter social relations, units or identities." Such a most general perspective leads to a definition which is open to all kinds of subjective appreciation, interchangeability, and negotiability. Resources have no fixed value: The utility of goods depends on the situation, for instance, manure and dung may be valuable resources in plant producing economic systems, obviously differing in quality from their value as fuel for nomadic livestock farmers. Climatic, social and cultural change also lead to changes in importance and usage of resources. Especially in a historical perspective, resources are of most diverse appreciation throughout times. To illustrate this, it is useful to take the price (gold:silver ratio) of gold through history (Ross and Bettenay 2023; cf. Zhang *et al.* 2015). Despite being constantly the most precious metal in preindustrial times, exchange value differences may demonstrate the importance of time, place and the actors to evaluate it.

So, what are resources according to Kiel practice and understanding? In Kiel University's Cluster of Excellence 'ROOTS — Social, Environmental, and Cultural Connectivity in Past Societies',[3] six subclusters are working on the origins and the history of

1. Socio-Environmental Hazards,
2. Domestication, Diet and Diseases,
3. Knowledge: Innovation, Cognition, and Technology,
4. Urban Agency and Perception,
5. Social Inequality and on
6. Conflicts: Competition and Conciliation.

In these different contexts, different perspectives on the use of resources are evident. The Hazards subcluster, for example, examines the consequences of the exploitation of resources or their sudden scarcity. The subcluster Conflict: Competition and Conciliation deals with resources as a trigger for the escalation of conflicts: wars are fought over access to resources and warfare is dependent on supplies (cf. Berndt 2018). But what role do resources play in de-escalation, pacification and conciliation?

The Knowledge subcluster not only examines knowledge about resources but also treats knowledge itself as a resource — we have already provided examples of this. The Urban subcluster looks at resource accessibility within the special environment of the city, often in contrast to the surrounding area. On the one hand, centrality is measured by the availability of goods and services and, on the other, the question arises as to whether urbanity itself can represent a resource? At what density of resources and services is a new level reached here? Such inequalities are also reflected in measures of the standard of living, especially becoming visible in nutrition. The Domestication, Diet and Disease subcluster asks, for example, about domestication and the physical, environmental and social consequences of domesticated resources and about basic physiological vs. superior consumption. The nutritional inequalities that emerge here are physical inequalities which are recorded and analysed as social inequalities at a societal and economic level by the Social Inequality subcluster. In the ROOTS cluster, social inequality is generally defined as unequal access to resources, which are available to society as a whole.

To address these questions in more overarching discussions, individual members from all subclusters have formed a joint working group, called "Interlinkage Group Resources and Economies". A joint questionnaire evolved out of these discussions which was drawn up asking about the resources being researched in the individual clusters (for the questionnaire, see Appendix 1). For each resource, all answers to a question were ranked in ascending order, with 0 being used for the least applicable answer. As different numbers of answers are possible for each question, the ranking numbers were standardised between 0 and 1. A double cluster analysis was carried out (*i.e.* across both the columns and the rows, Fig. 1). The unweighted paired group average UPGMA algorithm with the Gower distance-measure were used in PAST (Hammer 2024, 128–129 and 158). The chosen algorithm is one of the classical agglomerative hierarchical methods of clustering. Pairs of clusters with the shortest distances are combined step by step, whereby the distance between two clusters is the average of the pairwise distances of all objects in both clusters. All distances are included in the calculation on equal footing, *i.e.* unweighted. The Gower similarity index gives the sum of differences in each variable, normalised for the range of the variable. This distance measure therefore seems particularly suitable for measuring how different the ratings are.

Due to missing values, the example of Hellenistic astronomical knowledge, as evidenced in Greek philological studies, had to be excluded from the analysis. Terra preta as a resource (see above) had to be excluded, too, due to the early state of research.

A division into three clusters is clearly recognisable: the first cluster

1. contains medieval metals and building materials, but also the water supply of medieval towns. The presence of ox-hide ingots from the Mediterranean Bronze Age is initially unexpected. The following two clusters, apart from the above-mentioned exception, include exclusively all pre-medieval resources:
2. Neolithic and Bronze Age stone materials and amber are found next to each other. Bronze Age ox-hide ingots are also represented here, albeit from Central Europe. Finally, the third cluster
3. contains settlement and agricultural areas, agricultural tools and products.

The assessment of the resources with regard to their different qualities by different processors leads to quite comparable results: It is therefore easy to understand why, for example, the Bronze Age ingots from the Mediterranean region with its palaces and city-like settlements fall under the metals of the medieval cities.

3 https://www.uni-kiel.de/en/cluster-roots ; last access 26th August 2025

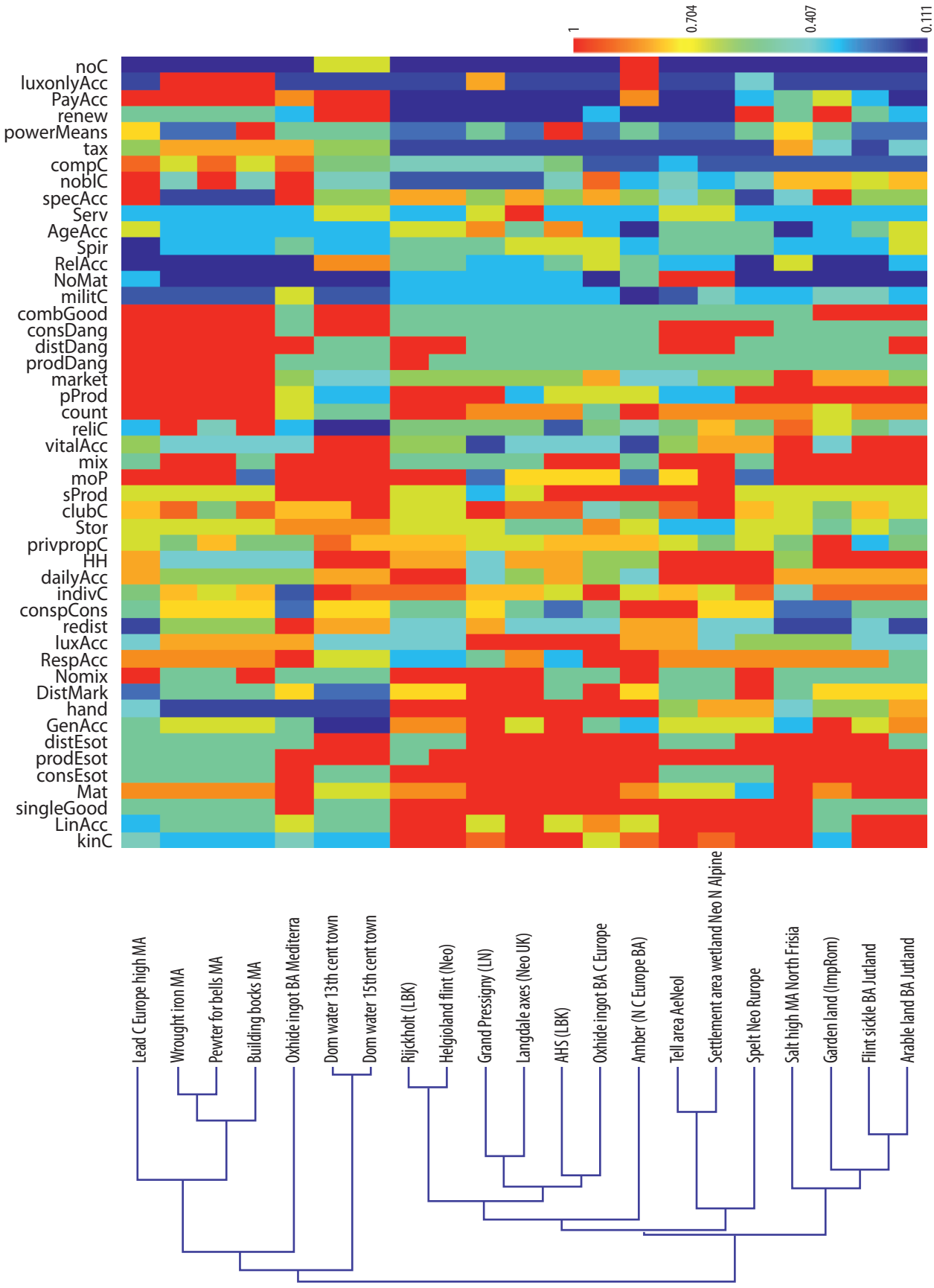

Fig. 1. Resources analysed in ROOTS (Appendix 2), grouping based on a double cluster analysis (UPGMA on Gower-distances).

The resources analysed in ROOTS follow the internal logic of technical use, on the one hand, and historical context dependency on the other. However, it also becomes clear how structural correspondences can be found in structurally comparable cases, even if they did not emerge from each other historically. It is also important for ROOTS that different research groups investigate comparable, even similar phenomena — from different perspectives, but with regard to the overarching research questions of ROOTS.

The economic problem mentioned above — how to satisfy unlimited wants and needs with limited resources — is realised as a question mal posée: Alternatively, ROOTS addresses the resource allocation problem as a problem of societal and inter-societal connectivity. There is no majority among ROOTS scholars for the concept of unlimited wants and needs which is regarded as an unhistorical axiom that does not stand the test of deep-time as provided by history and archaeology.

As further thought, we might conclude that while exchange rates, such as market prices in monetarised economies, were always context-dependent in the past, this will not be true in the future: For the first time in history, resources that never were scarce will be close to the limits of humankind's global survival. We are already recognising some absolute limits of the human niche. It is not so much the nature of resources as the definition of utility that we need to discuss in the future. What is the greatest utility and how can it be achieved? Sustainability management as a means of long-term resource allocation will take on paramount importance. While increasing needs have been emphasised in the past, increasing opportunities and degrees of freedom should also be stressed. Even if the opportunities may have lagged behind the increased needs in relative terms, in absolute terms and over millennia, one recognises the enormous unfolding of possibilities in development of technologies not only for production alone, but also for resource-allocation.

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REFERENCES

Arponen, V.P.J., Ohlrau, R. and Kerig, T., 2024. The Capability Approach and Archaeological Interpretation of Transformations: On the Role of Philosophy for Archaeology. *Open Archaeology* 10(1), 1–27. https://doi.org/10.1515/opar-2024-0013

Barrowclough, D., 2010. *Prehistoric Cumbria*. Stroud: History Press.

Bender, D., 2003. *Vahlens Kompendium der Wirtschaftstheorie und Wirtschaftspolitik* 2. München: Vahlen, 113–114.

Berndt, G.M., 2018. Gewaltsame Ressourcenbeschaffung – zu einigen raubwirtschaftlichen Praktiken gotischer Kriegergruppen. *In:* R. Keller and L. Sarti, eds. *Pillages, tributes, captifs: prédation et sociétés de l'Antiquité au haut Moxen Âge*. Paris: ED Sorbonne, 2018, 69–88.

Bogaard, A., Ortman, S., Birch, J., Cervantes Quequezana, G., Chirikure, S., Crema, E., Cruz, P., Feinman, G., Fochesato, M., Green, A., Gronenborn, D., Hamerow, H., Jin, G., Kerig, T., Lawrence, D., McCoy, M., Munson, J., Roscoe, J., Rosenstock, E., Thompson, A., Petrie, C.A. and Kohler, T., 2024. The Global Dynamics of Inequality (GINI) project: analysing archaeological housing data. *Antiquity* 98(397), e6. https://doi.org/10.15184/aqy.2023.188

Bradley, R. and Edmonds, M., 1993. *Interpreting the axe trade – Production and exchange in Neolithic Britain*, New Studies in Archaeology. Cambridge: Cambridge University Press.

Bridge, G., 2001. Art. "Resource Geography. 1. Resources Defined". *In: International Encyclopedia of the Social & Behavioral Science* 19, 13266–13269.

Cembrzyński, P., 2011. *Zaopatrzenie w wodę i usuwanie nieczystości w miastach stref bałtyckiej i sudecko-karpackiej w XIII–XVI wieku*, Wratislavia Antiqua 14. Wrocław: Instytut Archeologii Uniwersytetu Wrocławskiego.

Cembrzyński, P. and Jäcker, M., 2024. Use and Reuse of Lead in the Middle Ages – A Biography of Lead. *In:* J. Schneeweiß, ed. *Stories of Waste and Value. Roots of a Circular Economy*. ROOTS Booklet Series 04. Leiden: Sidestone Press, 64–71.

Daly, H.E., 1996. *Beyond Growth: the Economics of Sustainable Development*. Boston: Beacon Press.

Edinborough, K., Shennan, S., Teather, A., Baczkowski, J., Bevan, A., Bradley, R., Cook, G., Kerig, T., Parker Pearson, M., Pope, A. and Schauer, P., 2020. New Radiocarbon Dates Show Early Neolithic Date of Flint-Mining and Stone Quarrying in Britain. *Radiocarbon* 62(1), 75–105. https://doi.org/10.1017/RDC.2019.85

Eriksen, B.V., 2010. Flint working in the Danish Bronze Age – the decline and fall of a master craft. *In:* B.V. Eriksen, ed. *Lithic technology in metal using societies*, Jysk Arkaeologisk Selskabs skrifter 67. Højbjerg: Jutland Archaeological Society, 81–93.

Hammer, Ø., 2024. PAST PAleontological STatistics. Version 4.17. Reference Manual https://www.nhm.uio.no/english/research/resources/past/downloads/past4manual.pdf ; last access 31st May 2024

Högberg, A., 2009. *Lithics in the Scandinavian Late Bronze Age. Sociotechnical change and persistence*, BAR International Series 1932. Oxford: Archaeopress Achaeology.

JADE 2, JADE: *Grandes haches alpines du Néolithique Européen, VIe au IVe millénaires av. J.-C.* http://jade.univ-fcomte.fr ; last access 4th May 2023

Kerig, T., 2013. Wirtschaft: Struktur und Leistung in frühen Gesellschaften. *In:* M.K.H. Eggert and U. Veit, eds. *Theorie in der Archäologie: Zur jüngeren Diskussion in Deutschland*, Tübinger Archäologische Taschenbücher 10. Münster: Waxmann, 139–190.

Kerig, T., 2018. How equality became axed: Remarks on exchange networks and on the division of labour in the Central European Neolithic. *In:* M. Benz and T. Helms, eds. *Craft production systems in a cross-cultural perspective*, Studien zur Wirtschaftsarchäologie 1. Bonn: Habelt, 1–6.

Kerig, T., accepted, Copper and flint, business cycles and the conditions of knowledge transmission: a demographic explanation. *In:* B.V. Eriksen and L.E. Fisher, eds. *Quarries and mines in social context. Connecting patterns of change in Neolithic cultural landscapes*, Scales of Transformation in Prehistoric and Archaic Societies. Leiden: Sidestone.

Kerig, T., Hilpert, J., Strohm, S., Berger, D., Denis, S., Gauthier, E., Gibaja , J.F., Mallet , N., Massa, M., Mazzucco, N., Nessel, B., Pelegrin, J., Pétrequin, P., Sabatini, S., Schumacher, T.X., Serbe, B. and Wilkinson, T., 2023. Interlinking research: the Big Exchange project. *Antiquity* 97(394), e22. https://doi.org/10.15184/aqy.2023.78

Kerig, T. and Hilpert, J., eds., in press. *Raw Materials: Distributional and Social Inequalities in Prehistoric Exchange Networks*, ROOTS Studies. Leiden: Sidestone.

Lechterbeck, J. and Kerig, T., 2024. Inventions, innovations and the origins of spelt wheat. *Vegetation History and Archaeobotany*. https://doi.org/10.1007/s00334-023-00978-2

Løvschal, M., 2014. Emerging Boundaries: Social Embedment of Landscape and Settlement Divisions in Northwestern Europe during the First Millennium BC. *Current Anthropology* 55, 725–750. https://doi.org/10.1086/678692

Majchczack, B.S., Blankenfeldt, R., Bienen-Scholt, D., Hadler, H., Jürgens, F., Klooß, S., Reiß, A., Wilken, D., von Carnap-Bornheim, C., Rabbel, W. and Vött, A., 2024. Living on the Halligen tidal islands of North Frisia. Land-use and exploitation of a unique salt marsh landscape in the Middle Ages. *In:* A. Nieuwhof, E. Knol and H. van der Velde, eds. *Making places, making lives. Landscape and settlement in coastal wetlands. Proceedings of the 72th Sachsensymposion, 9–12 October 2021 Castricum-Alkmaar*, Neue Studien zur Sachsenforschung 14. Braunschweig: Braunschweigisches Landesmuseum, 143–160.

Mallet, N., Pelegrin, J. and Verjux C., eds. 2019. *Le phénomène pressignien: la diffusion des poignards et autres silex taillés du Grand-Pressigny en Europe occidentale au Néolithique (Mémoire LI)*. Chauvigny: Association des publications chauvinoises.

Mallet, N., Pelegrin, J., Thuel, E. and Verjux, C., in press. The Pressignian Phenomenon: The Spread of Large Flint Blades during the Neolithic. *In: Kerig and Hilpert in press.*

Midgley, M., 2013. From the Alps to Brittany and Scandinavia. The grand tour in the Neolithic. *In:* T. Kerig and A. Zimmermann, eds. *Economic archaeology: from structure to performance in European Archaeology*, Universitätsforschungen zur prähistorischen Archäologie 237. Bonn: Habelt, 85–94.

Molenda, D., 2001. *Polski ołów na rynkach Europy Środkowej w XIII–XVII wieku*. Warszawa: Instytut Archeologii i Etnologii PAN.

Müller, J., 2014. Bemerkungen zur sozialen Relevanz des roten Helgoländer Flints. *In:* Marschenrat zur Förderung der Forschung im Küstengebiet der Nordsee / Niedersächsisches Institut für historische Küstenforschung, eds. *Flint von Helgoland: die Nutzung einer einzigartigen Rohstoffquelle an der Nordseeküste. Marschenratkolloquium 26.–28. April 2012, Niedersächsisches Institut für historische Küstenforschung*, Wilhelmshaven, Siedlungs- und Küstenforschung im südlichen Nordseegebiet 37. Rahden/Westfalen: Verlag Marie Leidorf.

Nowak, K., 2008. Zur räumlichen Verteilung von Dechselklingen aus Aktinolith-Hornblendeschiefer in der Linearbandkeramik. *Archäologische Informationen* 31, 25–32.

Nielsen, N.H., Kristiansen, S.M., Ljungberg, T., Enevold, R. and Løvschal, M., 2019. Low and variable: Manuring intensity in Danish Celtic fields. *Journal of Archaeological Science: Reports* 27, 101955. https://doi.org/10.1016/j.jasrep.2019.101955

Ott, K. 2014. Institutionalizing strong sustainability: A Rawlsian perspective. *Sustainability* 6, 894–912.

Ott, K. and R. Döring, 2008. *Theorie und Praxis starker Nachhaltigkeit*. 2ndedition. Marburg: Metropolis.

Rawls, J. 1972. A theory of justice. Oxford: Clarendon Press.

Rössler, M. 1999. *Wirtschaftsethnologie – Eine Einführung*. Reimer: Berlin.

Ross J. and Bettenay, L., 2023. Gold and Silver: Relative Values in the Ancient Past. *Cambridge Archaeological Journal* 34(3), 403–420. https://doi.org/10.1017/S0959774323000355

Sabatini, S. and Lo Schiavo F., 2020. Late Bronze Age metal exploitation and trade: Sardinia and Cyprus. *Materials and Manufacturing Processes* 35, 1501–1518. https://doi.org/10.1080/10426914.2020.1758329

Scholz, A.K., Bartelheim, M., Hardenberg, R. and Staecker, J., eds., 2017. Resource*Culture. Sociocultural Dynamics and the Use of Resources – Theories, Methods, Perspectives*, RessourcenKulturen 5. Tübingen: Universität Tübingen.

Schwedler, G. and Němec, R., 2021. Architekturökonomie. Bauprojekte und Wirtschaftslogiken im Mittelalter. *In:* R. Němec and G. Schwedler, eds. *Architekturökonomie. Die Finanzierung kirchlicher und kommunaler Bauvorhaben im späteren Mittelalter*. Stuttgart: Steiner, 11–67.

Schneeweiß, J., 2022. Exzellenzcluster ROOTS: 3DARK DEPTH – Describing, Discussing and Developing Analytical Research Knowledge of the Dark Earth Phenomenon in Theory and Practice. *In:* B.V. Eriksen and C. von Carnap-Bornheim, eds. *Zentrum für Baltische und Skandinavische Archäologie, Jahresbericht 2021*. Handewitt: Stiftung Schleswig-Holsteinische Landesmuseen, 66.

Serbe, B., in press. *Bernstein in der Bronzezeit. Netzwerke und Interaktion in Europa*, ROOTS Studies 8. Leiden: Sidestone.

Sowina, U., 2016. *Water, Towns and People. Polish Lands against a European Background until the Mid-16th Century*. Frankfurt am Main: Peter Lang Editions.

Theather, A., Topping P. and Baczkowski J., 2019. *Mining and Quarrying in Neolithic Europe. A Social Perspective*, Neolithic Studies Group Seminar Papers 16. Oxford: Oxbow.

Wiesmann, U. and Messerli, P., 2007. Wege aus den konzeptionellen Fallen der Nachhaltigkeit – Beiträge der Geographie. *In:* R. Kaufmann, P. Burger and M. Stoffel, eds. *Nachhaltigkeitsforschung – Perspektiven der Sozial – und Geisteswissenschaften, Nachhaltige Entwicklung.* Bern: Schweizerische Akademie der Geistes- und Sozialwissenschaften, 121–142.

Zentgraf, D., PhD-project – *Experientia im antiken römischen Gartenbau. Zur Epistemologie von Erfahrungswissen zwischen Erfahrenheit und Erlebnis*. Kiel: Kiel University.

Zhang, R., Pian H., Santosh M. and Zhang, S., 2015. The history and economics of gold mining in China. *Ore Geology Reviews* 65, 718–727.

APPENDIX 1

Questionnaire on the resources analysed in ROOTS

Row header:

Name of resource in one region and in one time-slice (*e.g.* water in SW Asia Iron age towns, Rijckholt-flint from Early Neolithic, Fe from Roman Elba).

Columns:

The resource is controlled by

noC	Nobody
indivC	Individuals
noblC	Nobility
compC	Trading company
militC	Military
kinC	Kin-group
privpropC	Private ownership
clubC	Societies/clubs
reliC	Religious institution

The resource is

count	Countable
renew	Renewable
Mat	Material
NoMat	Non-material
Spir	Spiritual
Stor	Storable

Access to resource is restricted for groups of

GenAcc	Gender
AgeAcc	Age
LinAcc	Lineage
RelAcc	Religion
RespAcc	Respectability
PayAcc	by payment

Access to resource is

vitalAcc	Vital
dailyAcc	Desired for daily consumption
specAcc	Necessary for special production
luxAcc	For luxury consumption
luxonlyAcc	For luxury consumption only

The resource is important in

HH	Household (production and consumption)
hand	Hand-to-hand exchange
market	Market exchange/money
tax	State taxation
redist	State redistribution

Does resource/access to resource have a clearly visible function as

moP	Means of production
DistMark	Distinction marker
conspCons	Means of conspicuous consumption
powerMeans	Means of power

Resource belongs to

pProd	Primary products
sProd	Secondary products
Serv	Services

The resource can be/is used for the production of

mix	Many products
Nomix	A single product

The resource can only be used

combGood	In combination with other resources/goods
singleGood	On its own

The production of the resource is

prodDang	Dangerous
prodEsot	Requires esoteric knowledge

The distribution of the resource is

distDang	Dangerous
distEsot	Requires esoteric knowledge

The consumption of the resource is

consDang	Dangerous
consEsot	Requires esoteric knowledge

APPENDIX 2

Resources analysed in ROOTS

Building blocks MA	Schwedler oral comm.
Wrought iron MA	Schwedler oral comm.
Pewter for bells MA	Schwedler oral comm.
Domestic water in MA town (13th century)	Cembrzynski 2011, Sowina 2016
Domestic water in MA town (15th century)	Cembrzynski 2011, Sowina 2016
Rijckholt (LBK)	Kerig *et al.* 2023
Grand Pressigny	Mallet *et al.* 2019; Mallet 2024
Helgioland flint	Marschenratskolloquium 2012
AHS (LBK)	Nowak 2008
Salt in High Medieval North Frisia	Majchczack *et al.* 2024
Amber (N C Europe BA)	Serbe in press
Tell area AeNeol	Bogaard *et al.* 2024
Settlement area wetland Neo N Alpine	Bogaard *et al.* 2024
Lead C Europe High MA	Molenda 2002; Cembrzynski and Jäcker 2024
Langdale axes	Kerig *et al.* 2023
Spelt Neo Europe	Lechterbeck and Kerig 2024
Garden land (ImpRom)	Zentgraf (PhD-project)
Flint sickles in BA Jutland	Högberg 2009; Eriksen 2010
Arable land BA Jutland	Løvschal 2014; Nielsen *et al.* 2019
Oxhide ingot BA C Europe	Sabatini and Lo Schiavo 2020
Oxhide ingot BA Mediterra	Sabatini and Lo Schiavo 2020

Resisting Inequality

Or What Happened to the Ertebølle Hunter/Fishers When Neolithic Farmers Arrived in Denmark?

Kristian Kristiansen

KEYWORDS: *Neolithisation, migration, equality, inequality*

Abstract

One question has always remained essential to answer for archaeologists interested in the role of political economies in prehistory: Why did a majority of people leave power in the hands of a minority? How did this come about, but also how did it end? Under what conditions was resistance to social hierarchies and inequality successful? Here, I look more closely into how two modes of production interacted with each other prior to the final Neolithisation process in Denmark after 4000 BCE, as well as how it unfolded after 4000 BCE. Two possible strategies were at hand for Ertebølle hunter/fishers when Neolithic farmers started to move north into Denmark: They could have retreated to areas without interest to farmers to continue their lifestyle, or they could have, if possible, converted to a new lifestyle as farmers. However, the two modes of production rested on basically divergent lifestyles and thus different values concerning equality/inequality, which became decisive for the outcome.

Zusammenfassung

Für Archäologen, die sich für die Rolle der politischen Ökonomie in der Vorgeschichte interessieren, ist eine Frage immer von zentraler Bedeutung: Wie kommt es, dass eine Mehrheit der Menschen die Macht in den Händen einer Minderheit belässt? Wie kommt es dazu, aber auch wie endet es: Unter welchen Bedingungen war der Widerstand gegen soziale Hierarchien und Ungleichheit erfolgreich? Hier untersuche ich genauer, wie zwei Produktionsweisen vor der endgültigen Neolithisierung Dänemarks nach 4000 v. Chr. miteinander interagierten und wie die Produktion sich nach 4000 v. Chr. entfaltete. Den Ertebølle Jägern und Fischern standen zwei mögliche Strategien zur Verfügung, als die neolithischen Bauern begannen, in den Norden Dänemarks vorzudringen: Sie konnten sich in Gebiete zurückziehen, die für die Bauern uninteressant waren, um ihre Lebensweise fortzusetzen, oder sie konnten, wenn möglich, auf eine neue Lebensweise als Bauern umstellen. Die beiden Produktionsformen basierten jedoch auf grundlegend verschiedenen Lebensweisen und damit auf unterschiedlichen Wertvorstellungen von Gleichheit/Ungleichheit, die für das Resultat entscheidend waren.

BACKGROUND

One question has always remained essential to answer for archaeologists interested in the role of political economies in prehistory: how come that a majority of people will leave power in the hands of a minority of people (Earle 1996; Flannery and Marcus 2014). How did it come about, but also how did it end: under what conditions was resistance to social hierarchies and inequality successful? (Hansen and Müller 2017). Such fundamental questions have remained a recurring theme in Johannes Müllers lifelong dedication to an archaeology that always took the material and environmental conditions into account in European prehistory.

Answers have varied from equality being a natural state of affairs that was defended and maintained whenever possible (Clastres 1977), to inequality and competition being the natural state of affairs (Friedman 1985). These are the hot and cold societies of Levi Strauss (1966). More recently David Graeber and David Wengrow's major opus '*The Dawn of Everything*' (Graeber and Wengrow 2021) forcefully popularized and exemplified the counternarrative to inequality as being an inevitable outcome of history and prehistory, showing there were always societies that were organized around a more equal sharing of power, even among more complex societies. In later European prehistory we find what I have termed 'decentralized complexity' (Kristiansen 2010), which persisted for several thousand years from the 3rd millennium BCE until Medieval Christian states took hold after 1000 CE. Even if these societies were ranked, they maintained openness to social mobility and change, and they resisted centrality and urbanism during the Roman Empire.

This was a major theme of my book '*Europe before History*' (Kristiansen 1998): how come that temperate Europe resisted state formation until recent historical times? The fight between the Roman Empire and Barbarian Germanic societies can be interpreted within this master narrative leading up to present day populist narratives of retaining this spirit of decentralization with old European origins (Kristiansen 1998, chap. 1.2; Hofmann and Frieman 2021; Hofmann *et al.* 2021).

I propose that to provide answers to such fundamental questions we need to anchor them in a better understanding of change and tradition in the material record. This also includes how culture changes, and how we define continuity versus discontinuity. But as a first step we must be able to discern between different social groups and institutions in the material record. In figure 1 I have outlined some basic component in such an analytical strategy. This leads on to a discussion of how different interpretative steps are linked together in a theoretical '*chaîne opératoire*' which I shall now discuss.

THEORETICAL FRAMEWORK

Theoretical and material categories must be framed in a dialectic interplay that is historically contingent and general at the same time. Here I apply a materialist framework (Kristiansen and Earle 2022). However, such a framework can be applied in different ways for different purposes, as discussed above. Materialism, materialization, and materiality take you from concepts to objects and their impact (Fig. 1). They are general theoretical categories that can be applied universally in conjunction with historically specific interpretative strategies. Each historical epoch is constituted by a number of basic institutions that should be identified in the material record. They are defined by institutional practices (rituals, dances, sports) some of which can be identified in the material record if they are concluded by an act of deposition or other forms of materialization *e.g.* in rock art or hoarding. Furthermore, it is often the case that such practices are linked to constructions, whether barrows, procession roads/stones, *etc.* that constitutes a framework for organized action. In this way ideology provides a basic value system that keeps society together.

Thus, specific theoretical and interpretative problems demand the formulation of corresponding theoretical categories. They should form an interactive, interpretative strategy that allows you to move back and forth and adjust both interpretations and theoretical categories. Importantly, we need to understand the role of institutions in human societies in order to understand culture (Bondarenko and Kowalewski 2020, discussed in Feinman 2021), and they are linked together by norms and shared values (ideology). Institutions define social codes of conduct within their domain, just as culture defines artistic codes of conduct. Tensions may arise when contradictions become visible between ideology and practice: such diversity can either be solved or, if remaining unresolved, lead on to social and cultural resistance and change. One of the most difficult problems in archaeology, is to define when this happens, because material culture will often attempt to 'cover up' such internal problems, until they reach a breaking point. This is often followed by a rather fast change, whether in culture or social organization. Thus, to detect the rise of contractions before they become visible in the material record, will often demand support from environmental and dietary studies that can reveal if changes were already under way. This interpretative difficulty is well illustrated by the Neolithisation process taking place in Denmark during the centuries before and after 4000 BC (Kristiansen 2002).

In the following, I shall look more closely into how two modes of production interacted with each other prior to the final Neolithization process in Denmark after 4000 BCE, as well as how it unfolded after 4000 BCE. Two possible strategies were at hand for Ertebølle people when Neolithic farmers started to move north into Denmark: they could retreat to areas without interest to farmers to continue their lifestyle, or they could, if possible, convert to a new lifestyle as

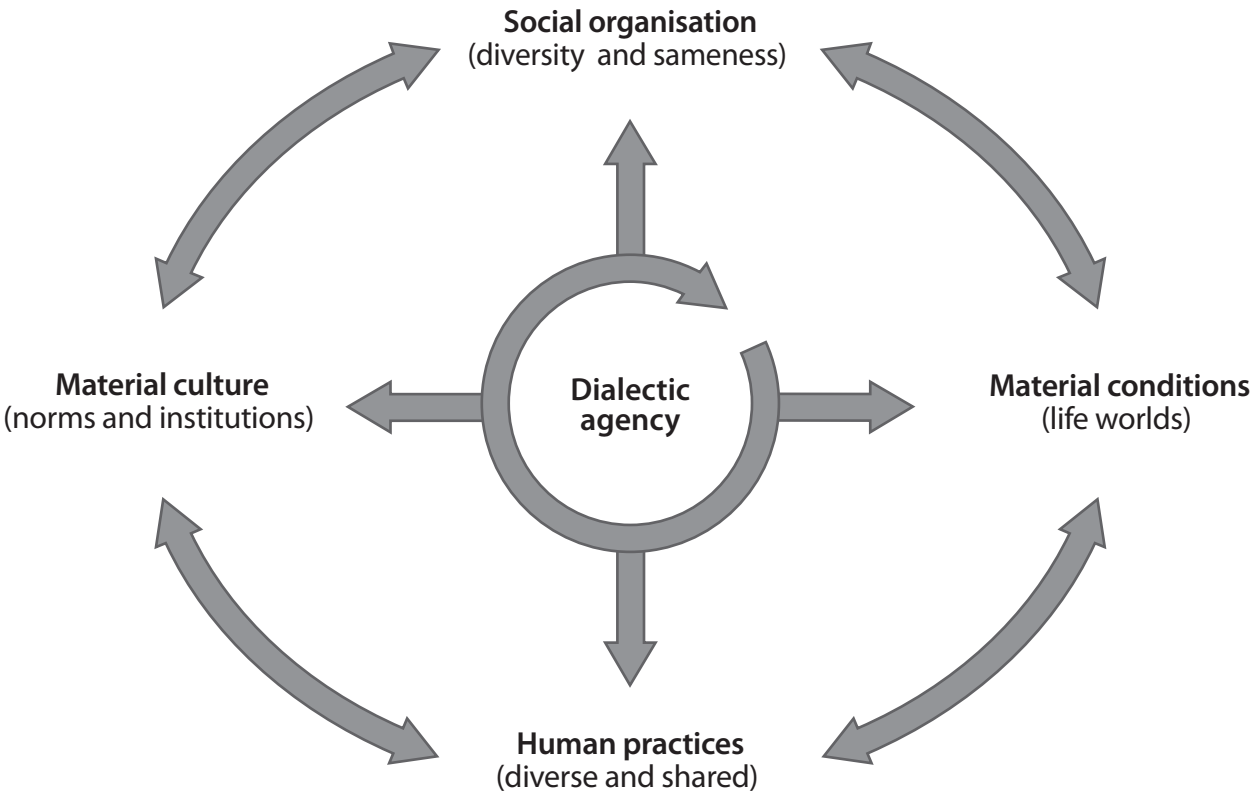

Fig. 1. Dynamic model of norms versus life world, practice versus social organization and their dialectic interplay.

farmers. However, the two Modes of Production rested on basically different lifestyles and thus different values concerning equality/inequality. Even if Neolithic pioneer groups probably had a rather flat social structure of collective labor investment, it differed radically from a hunter/gather lifestyle. In figure 2 I contrast how ideologies or strategies of equality and inequality lead to different value strategies or principles of how to organize society. However, the two strategies are not mutually contradictory. They co-exist in most societies in a dialectic interplay where over time one or the other may become dominant (Fig. 1). In the following I apply this framework on the Danish neolithization case.

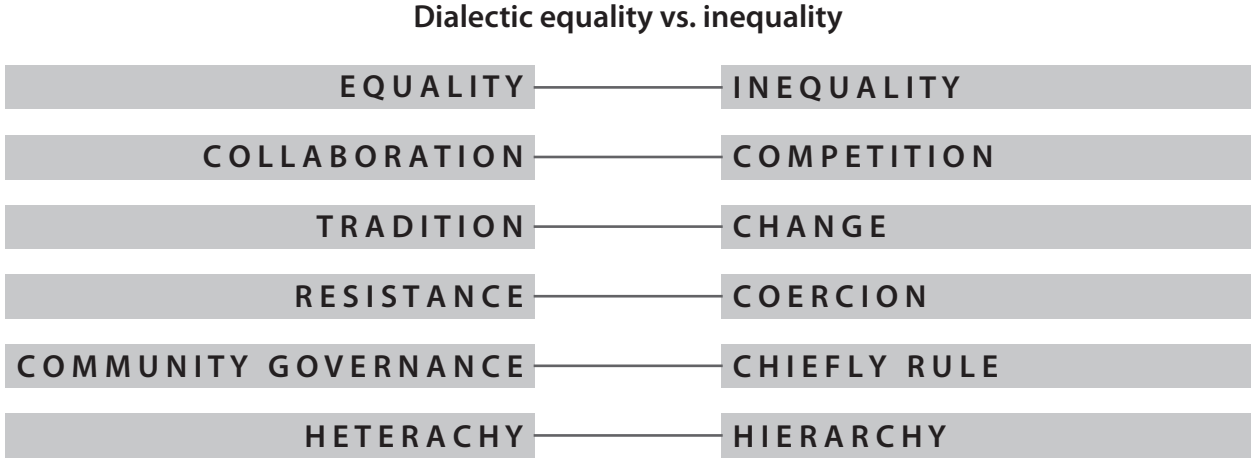

Fig. 2. The dialectic between equality and inequality as founding ideologies and their long-term effects on basic principles of social organization.

RESISTING INEQUALITY: WHAT DID HAPPEN TO THE ERTEBØLLE PEOPLE WHEN FARMERS ENTERED DENMARK?

In a recent study it was demonstrated Ertebølle hunter-fishers disappeared when Neolithic farmers moved in 3900 BCE. No genetic admixture took place:

"*at around 5,900 cal. bp, our multiproxy dataset documents a marked and abrupt concomitant shift in genetic, phenotypic, dietary and vegetation parameters.*"
(Allentoft *et al.* 2024, 332 fig. 3)

It remains a mystery what happened to the Ertebølle people.

"*We do not know how the Mesolithic Ertebølle population disappeared. Some may have been isolated in small 'pockets' of brief existence and/or adapted to a Neolithic lifestyle. The most recent individual in our Danish dataset with hunter-gatherer ancestry is the aforementioned Dragsholm Man (NEO962), dated to 5,947–5,664 cal. bp (95 % confidence interval) and archaeologically assigned to the FBC based on his grave goods.*" (Allentoft *et al.* 2024)

Thus, while there was no space in the paper to enter a discussion of possible scenarios, I shall now develop what I consider the most probable series of events preceding the colonization of Denmark by Neolithic farmers. Firstly, it should be noted that during a period of a few hundred years before the Neolithisation process started Ertebølle hunter-gatherers and Neolithic farmers had maintained exchange relations that profoundly impacted the Late Mesolithic cultural repertoire, by the adaptation of pottery, as well as new forms of axes, as well as imported Danubian 'shoe-last adzes' (Klassen 2004; Meyer 2023; Gron and Sørensen 2018). We can only speculate what Ertebølle people provided in return, but exotic products from their environment would certainly have been possible, as known from more recent ethnographic studies of such interactions (Nicolaisen 1975; 1976). Thus, we may envisage that the Ertebølle people were well informed about Neolithic societies and their lifestyle, but were not attracted to adapt to it, also well-known from ethnographic case studies. It implies that they valued their lifestyle higher than that of farming, and here we are at the root of the equality/inequality debate: what they valued higher was probably also a lifestyle of relative social/economic equality and freedom, compared to what they experienced among the Neolithic communities they had visited during many generations of small-scale trade interactions.

Thus, when groups of Neolithic farmers started their migrations to colonize Denmark most Ertebølle people choose to retreat to their peers in south Norway who maintained a hunter-fisher lifestyle for another millennium. Some groups did not make it to Norway, but retreated to small refugia pockets, such as to the inland lake and moorland area of Åmosen on Zealand, and on some coastal settlements likewise unsuitable for farmers (Gron and Sørensen 2018, 966–967 fig. 5–6). Here they survived for a few generations and adopted more of the Neolithic package creating a mixed Ertebølle/Funnel Beaker (TRB) material culture, what Jørgen Troels-Smith originally identified as the first phase of the adaptation to farming (Troels-Smith 1954), against Carl Johan Becker's full-scale migration/colonization model of inland TRB settlements (Becker 1954). These early results are now further illuminated and elaborated through large scale excavations connected to the Femarnbelt-tunnel project on Lolland, where there is co-existence during several hundred years of Ertebølle and Funnel Beaker populations (Gross and Rothstein 2023). But it still leaves open what happened to the majority of Ertebølle hunter/fishers? And how the Neolithization process unfolded through time (Hofmann *et al.* 2024, 70–75)?

Here Kurt Gron and Lasse Sørensen (2018) provided an interesting model of a four-phase interaction and transformation process. The period between 4400–4000 BCE they call the contact/scouting period, where increasing exchanges took place and the two groups familiarized with each other. This is followed by an introduction phase where Neolithic colonizers arrive, which marks the beginning of a negotiation phase ending no later than 3700 BCE, probably much earlier according to the recent study by Morten Allentoft *et al.* (2024). Since a full genetic replacement took place during this period, without leaving any visible traces of violence, the more probable scenario would be then that Ertebølle hunter/fisher groups, when they realized what was going to happen, retreated north, even prior to 4000 BCE. Evidence for this is presented in a recent study on summed ^{14}C dates in the Oslo fjord region by Svein Nielsen *et al.* (2019). They observe that

"*the flint industries around the Oslo fjord changed markedly already in the period ~6600–5900 cal BP towards tool manufacture techniques within the southern Scandinavian Ertebølle (Eigeland 2015; Fischer 2002; Glørstad 2004, 51–55). Contact between eastern Norway and the Ertebølle in this period could have been caused by increased pressure on the border between the Ertebølle and their neighbouring farmers to the south*".
(Svein Nielsen *et al.* 2019)

In a follow up study from Svein Nielsen in 2021 he provided more conclusive evidence from summed ^{14}C

dates, indicating a rise in activities linked to Ertebølle influences in material culture, *e.g.* transverse arrowheads, already starting in the final phase of Ertebølle, during the period of interaction with Neolithic societies. A peak is reached, however, around 4000 BCE (Nielsen 2021, 165 fig. 4). It suggests that other factors than colonizing farmers were at play in the last centuries before 4000 BCE. I cite from the conclusion:

"*The interpretative model for the last centuries of the Mesolithic in Southern and Central Scandinavia suggests that the spread of farming on the European continent eventually led to shortage of space for late hunter-fisher-gatherers. Yet this presumed shortage did not force foragers to adopt agriculture, even in situations when we can expect awareness of it, which was probably the case in Southern Scandinavia during the Late Ertebølle phase, when contact with farmers increased. Rather, under such circumstances hunter-fisher-gatherers dispersed into new territories, in this case east and north of the Kattegat Sea, where interaction with foreign communities increased and effectively produced unique cultural historical trajectories.*" (*ibid.*,169)

What motivating factors did there exist for this northward spread? Svein Nielsen suggests that demographic expansion and increased competition over resources in late Ertebølle society could be one explanation. However, I want to add to this an ideological dimension: the expansion began when late Ertebølle groups started to interact with Neolithic societies, and borrowed pottery technology, as well as a new type of T-shaped axe. However, these two innovations were not brought north by the migrating groups. This may indicate an ideological split among Ertebølle groups between those who wanted to collaborate with farmers to the south, and those who did not. The latter eventually decided to leave, and numbers increased around 4000 BCE when farmers started to move north. Thus, ideological contradictions resulted in increased cultural and social diversity leading some groups to migrate north (Fig. 1). Such internal tensions and contradictions between 'collaborators' and 'non-collaborators' represent a classic dualism when a more powerful 'high culture' confronts a less powerful society, well known among Germanic tribes and their collaboration or resistance to Roman trade and diplomatic contacts (Hedeager and Kristiansen 1981).

What about the Ertebølle collaborators that decided to stay? How many were they and how important were they for the incoming Neolithic farming groups? In a most recent paper Theis Jensen and Lasse Sørensen (2023) suggest that both the converted Dragsholm individual, and new evidence from Lolland of a surviving Mesolithic individual dating as late as 3700 BCE represented the end of a process that began 400–500 years earlier. Thus, they define the beginnings of collaboration during the period of increasing trade and contact 4400–4000 BCE. During this period Ertebølle groups expanded and diversified their use of the landscape from larger coastal settlements to smaller specialized inland sites for fur hunting, which could have been one of the high-status products traded to Neolithic farmers. Jensen and Sørensen further suggest that Neolithic farmers now in contact with Ertebølle groups began scouting expeditions to explore the south Danish landscapes for their agrarian potential, for which purpose they also needed Ertebølle scouts with local knowledge. During this period Ertebølle hunter gatherers who did not welcome the new way of life started to retreat north, as previously discussed. We should therefore envisage the continuity of Ertebølle coastal sites with adapted Funnel Beaker cultural traits as traditional long-term collaborators who wished to combine the best of two worlds, by providing special products to the pioneer farmers, while retaining most of their traditional lifestyle. On Lolland this interaction continued for several hundred years, and it is reflected in a varied diet among both groups (Phillipsen 2023). However, due to their rather small numbers as relict populations Ertebølle groups faced a problem of demographic reproduction, as farmers did not want to mix sexually/genetically with hunter-gatherers, which they considered cultural inferior. By 3700 BCE this 'duality' phase came to an end, when Neolithic communities had consolidated socially, economically and demographically, and entered a new expansion phase (Johansen 2023). Theis Jensen and Lasse Sørensen characterize the development in this way:

"*The phase of population duality lasted until the dual presence of foraging and farming activities shifted decisively in favour of the latter. Afterwards, from 3700 to 3300 BCE, a homogenisation phase began, involving increased exploitation of the landscape, as well as flint sources, and the construction of large-scale monuments.*" (Jensen and Sørensen 2023, 94)

CONCLUSION

The Neolithisation of Denmark demonstrates emerging contradictions between two different modes of production, that had coexisted and interacted for several hundred years, albeit geographically separated. During this phase a cultural and social split occurred among Ertebølle groups between those wanting to

collaborate and those who wanted to resist the new way of life. The latter consequently started to move north to their hunter-gatherer peers in western Sweden and southern Norway, also bringing new traits of Ertebølle material culture along.

After 4000 BCE interaction was replaced by farming colonization, which resulted in final the take-over of one mode of production (farming) at the expense of another (hunter/gatherer), whose members were either gradually marginalized or choose to retreat to their peers in Norway, to maintain a more egalitarian lifestyle. Thus, the ideology of a hunter/gatherer lifestyle resisted the introduction of farming as long as possible, which probably reflect a more global condition throughout history.

REFERENCES

Allentoft, M.E., Sikora, M., Fischer, A., Sjögren, K.-G., Ingason, A., Macleod, R., Rosengren, A., Schulz Paulsson, B., Jørkov, M.L.S., Novosolov, M., Stenderup, J., Price, T.D., Fischer Mortensen, M., Nielsen, A.B., Ulfeldt Hede, M., Sørensen, L., Nielsen, P.O., Rasmussen, P., Jensen, T.Z.T., Refoyo-Martínez, A., Irving-Pease, E.K., Barrie, W., Pearson, A., Sousa Da Mota, B., Demeter, F., Henriksen, R.A., Vimala, T., McColl, H., Vaughn, A., Vinner, L., Renaud, G., Stern, A., Johannsen, N.N., Ramsøe, A.D., Schork, A.J., Ruter, A., Gotfredsen, A.B., Henning Nielsen, B., Brinch Petersen, E., Kannegaard, E., Hansen, J., Buck Pedersen, K., Pedersen, L., Klassen, L., Meldgaard, M., Johansen, M., Uldum, O.C., Lotz, P., Lysdahl, P., Bangsgaard, P., Petersen, P.V., Maring, R., Iversen, R., Wåhlin, S., Anker Sørensen, S., Andersen, S.H., Jørgensen, T., Lynnerup, N., Lawson, D.J., Rasmussen, S., Korneliussen, T.S., Kjær, K.H., Durbin, R., Nielsen, R., Delaneau, O., Werge, T., Kristiansen, K. and Willerslev, E., 2024. 100 ancient genomes show repeated population turnovers in Neolithic Denmark. *Nature* 625, 329–337. https://doi.org/10.1038/s41586-023-06862-3

Becker, C.J., 1954. Stenalderbebyggelsen ved St. Valby i Vestsjællands amt. *Aarbøger for Nordisk Oldkyndighed og Historie*, 127–197.

Bondarenko, D.M., Kowalewski, S.A. and Small, D.B., eds., 2020. *The Evolution of Social Institutions*. Cham: Springer.

Clastres, P., 1977. *Society Against the State*. Oxford: Basil Blackwell.

Earle, T., 1997. *How Chiefs Come to Power: The Political Economy in Prehistory*. Stanford: Standford University Press.

Eigeland, L., 2015. *Maskinmennesket i steinalderen. Endring og kontinuitet i steinteknologi fram mot neolitiseringen av Øst-Norge*. PhD thesis. Oslo: Universitetet i Oslo.

Feinman, G., 2021. 'The Evolution of Social Institutions': Review and Prospect. *Social Evolution & History* 20(2), 198–208.

Fischer, A., 2002. Food for feasting. *In:* A. Fischer and K. Kristiansen, eds. *The Neolithisation of Denmark – 150 Years of Debate*, Sheffield Archaeological Monographs 12. Sheffield: J.R. Collis Publications, 343–393.

Flannery, K.V. and Marcus, J., 2014. *The Creation of Inequality: How Our Prehistoric Ancestors Set the Stage for Monarchy, Slavery, and Empire*. Cambridge: Harvard University Press.

Friedman, J., 1985. The chicken in the egg and Captain Cook: an essay in transformational anthropology. *In:* T. Vuyk, ed. *Essays in Structural Change: the L.H. Morgan Society Symposium*. Leiden: University of Leiden, Institute of Cultural and Social Studies.

Glørstad, H., ed., 2004. *Svinesundprosjektet 4. Oppsummering av Svinesundprosjektet*, Fornminneseksjonen Varia 57. Olso: Universitetets Kulturhistoriske Museer.

Graeber, D. and Wengrow, D., 2021. *The Dawn of Everything*. London: Allen Lane.

Gron, K.J. and Sørensen, L., 2018. Cultural and economic negotiation: a new perspective on the Neolithic Transition of Southern Scandinavia. *Antiquity* 92(364), 958–974.

Groß, D. and Rothstein, M., eds., 2023. *Changing Identity in a Changing World. Current Studies on the Stone Age around 4000 BCE*. Leiden: Sidestone Press.

Hansen, S. and Müller, J., eds., 2017. *Rebellion and Inequality in Archaeology: Proceedings of the Kiel Workshops "Archaeology of Rebellion" (2014) and "Social Inequality as a Topic in Archaeology" (2015)*. Bonn: Habelt.

Hedeager, L. and Kristiansen, K., 1981. Bendstrup – en fyrstegrav fra ældre romersk jernalder – dens sociale og historiske miljø. *Kuml* 30, 81–164.

Hofmann, D., Hanscam, E., Furholt, M., Baca, M., Reiter, S.S., Vanzetti, A., Kotsakis, K., Peterson, H., Niklasson, E., Hølleland, H. and Frieman, C.J., 2021. Forum: Populism, Identity Politics, and the Archaeology of Europe. *European Journal of Archaeology* 24(4), 519–555.

Hofmann, D. and Frieman, C.J., 2021. Introduction: Archaeology and Populism. *European Journal of Archaeology* 24(4), 1–5. https://doi.org/10.1017/eaa.2021.29

Hofmann, D., Frieman, C., Furholt, M., Burmeister, S., Johansen, N.N., 2024. *Negotiating Migrations*. The Archaeology and Politics of Mobility. London: Bloomsbury.

Jensen, T.Z.T. and Sørensen, L., 2023. Duality in the Early Neolithic on Lolland-Falster and in south Scandinavia. *In: Groß and Rothstein 2023*, 89–108.

Klassen, L., 2004. *Jade und Kupfer: Untersuchungen zum Neolithisierungsprozess im westlichen Ostseeraum unter besonderer Berücksichtigung der Kulturentwicklung Europas 5500–3500 BC*. Århus: Jutland Archaeological Society.

Kristiansen, K., 1998. *Europe before History*. Cambridge: Cambridge University Press.

Kristiansen, K., 2002. "The Birth of Ecological Archaeology in Denmark: History and Research Environments 1850–2000." *In:* A. Fischer and K. Kristiansen, eds. *The Neolithisation of Denmark: 150 Years of Debate*. Sheffield: John Collis, 11–31.

Kristiansen, K., 2010. Decentralized Complexity: The Case of Bronze Age Northern Europe. *In:* T.D. Price and G.M. Feinman, eds. *Pathways to Power, Fundamental Issues in Archaeology*. New York: Springer, 169–192. https://doi.org/10.1007/978-1-4419-6300-0_7

Kristiansen, K. and Earle, T., 2022. Modelling Modes of Production: European 3rd and 2nd Millennium BC Economies. *In:* M. Frangipane, M. Poettinger and B. Schefold, eds. *Ancient Economies in Comparative Perspective*. London: Springer, 131–165.

Lévi-Strauss, C., 1966. *The Savage Mind* (English Translation from the Original French Version: La Pensee Savage, 1962). Chicago: University of Chicago Press.

Meyer, A.-K. 2023. Long-term perspectives on Neolithisation. Pottery use in the Ertebølle Culture and its connection to the development of settlement patterns and hunter-gatherer complexity. *In: Groß and Rothstein 2023*, 109–126.

Nicolaisen, J., 1975. The Negritos of Casiguran Bay. Problems of affluency, territoriality and human aggressiveness in hunting societies of Southeast Asia. *Folk* 16–17, 401–34.

Nicolaisen, J., 1976. The Penan of Sarawak. Further notes on the neo-evolutionary concept of hunters. *Folk* 18, 205–36.

Nielsen, S.V., Persson, P. and Solheim, S., 2019. De-Neolithisation in southern Norway inferred from statistical modelling of radiocarbon dates. *Journal of Anthropological Archaeology* 53, 82–91. https://doi.org/ 10.1016/j.jaa.2018.11.004

Nielsen, S.V., 2021. A Late Mesolithic Forager Dispersal Caused Pre-Agricultural Demographic Transition in Norway. *Oxford Journal of Archaeology* 40(2), 153–175.

Philippsen, B., 2023. Changing diet in a changing world. *In: Groß and Rothstein 2023*, 127–148.

Troels-Smith, J., 1954. "Ertebøllekultur-bondekultur:Resultater af de sidste 10 års undersøgelser i Åmosen (Ertebølle Culture-Farmer Culture: results from the past ten year's excavations i Åmosen Bog, West Zealand)." *Aarbøger for nordisk Oldkyndighed og Historie 1953*, 5–62.

Economics and Prehistoric Archaeology – A Marxian Argument

Konrad Ott

KEYWORDS: *archaeology, economics, Marx, economic regularities*

Abstract

The following article presents an argument for a more relaxed recourse to modern economic theories in prehistory and early history. By doing so, the article wishes to liberate prehistoric archaeology and early history from its aversion against modern economics. Originally, the argument was made by Karl Marx. In 1859, Marx believed that theories that refer to the most complex economic system within history, namely capitalistic modes of production, are key to an improved understanding of all past societies. Today, Marx's argument holds a fortiori because the scope of economic theories has been widened. Here, the contribution presents Marx's argument, offers a broad scope of economic theories, proposes a contest between orthodox and heterodox economic theories and discusses some presumed economic regularities as a basis for hypothesis formation.

Zusammenfassung

Der nachfolgende Artikel präsentiert ein Argument für einen unverkrampfteren Rückgriff auf moderne ökonomische Theorien in der Ur- und Frühgeschichte. Hierdurch möchte der Artikel die Ur- und Frühgeschichte von ihren weit verbreiteten Aversionen gegen Ökonomik befreien. Das Argument stammt von Karl Marx. Marx glaubte 1859, dass Theorien, die zur Erklärung des komplexesten aller bekannten ökonomischen Systeme, nämlich der kapitalistischen, waren-förmigen Produktionsweise, dienlich dazu seien, weniger komplexe ökonomische Ordnungen besser zu verstehen. Gegenwärtig gilt Karl Marx' Argument umso mehr, da das Spektrum ökonomischer Theorien breiter geworden ist. Der Artikel rekonstruiert Marx' Argument, zeigt das Spektrum ökonomischer Theorien auf, schlägt einen Wettbewerb zwischen heterodoxen und orthodoxen Theorien vor und diskutiert mögliche ökonomische Regularitäten als Grundlage für Hypothesenbildung.

INTRODUCTION

For the rest of my life, I am highly grateful to Johannes since he urged me to join the teams of CRC 1266 and ROOTS. These were unforgettable intellectual years. Beside some articles, my "*Epistemology, Economics, and Ethics*" (EEE) (Ott 2023) is the result of these "great" years in both teams. Part 1 of EEE explains on a meta-theoretical, epistemological layer how theoretical investments (TI) in prehistoric archaeology can be made, warranted, or rejected. Following Hawkes (1954), the guiding metaphor for this meta-theory is "scaffolding on a ladder". Economic life is a crucial step on the epistemic ladder. The second part of EEE reloads original historical materialism as TI without commitments to political Marxism. Historical materialism sees human being as "producing" agents.

The following article deepens an argument which has been made in this second part of EEE. This second part deals with economic practices and their theoretical conceptions and modelling. "Economy" is an umbrella term for human activities which qualify as economic ones, while "economics" denotes theoretical conceptualizations of such activities. The realm of economic activities is defined by Lowe (1965, 6–31). Economic theories refer to this realm, but they can be expanded to human behaviour in its entirety ("rational choice"-paradigm). I restrict economic theory to its proper scope to avoid colonisation of non-economic spheres of life.

AMBIGUITY OF ECONOMICS IN ARCHAEOLOGY

At the occasion of many presentations, conferences, publications, and informal talks in prehistoric archaeology, I registered an ambivalence. One the one hand, archaeologists pointed to modes of production and exchange, foraging, storage, technologies, labour, horti- and agriculture, herding, trade *etc.* which are to be seen as economic activities also on the emic side of the agents. It is hard to deny that humans have been economic agents in the archaic ("prehistoric" [1]) periods of history. Archaeology always consumes economic theories and it can't do otherwise.

On the other hand, however, many archaeologists are highly reluctant to invest modern economic theories, especially liberal ("neo-classical") ones, in order to model and explain human behaviour in prehistoric (= archaic) communities. If they make TI in this respect, they favour theories which are not mainstream in contemporary economics (such as Mauss and Bataille). Widespread sympathies for "anarchism" run counter to current mainstream economics (Graeber and Wengrow 2021).

Such reluctance may rest on sound *epistemological* concerns. Archaeologists may argue that, for archaic humans, labour, leisure, production, education, consumption, festivities, *etc.* are integrated into seamless webs of life that we should not split apart into distinct spheres, economy among them. The "seamless-web-of-life" approach should, however, not be taken for granted. Why should we not assume that archaic human beings were capable of distinguishing between, say, different "spheres", "roles", "task-scapes" and "domains" by which their way of life was organised? We commonly distinguish between different dimensions of our identities (Taylor 1989; Smith 2012), so why could not archaic humans do so?

Another argument warns that historians should not conceive archaic modes of life as being determined by economic activities. Fair enough, but economics does not generally imply complete determination of humans by economic forces. Only radical structuralism entails such implication. Normally, economics only stipulates that there was a domain of economic activities among other domains (= spheres) of life. The tension between structure and agency is supposed in most economic theories.

Reluctance against modern economics stems, or so I speculate, not just epistemological concerns but, at least in part, from moral and political motives. As I heard archaeologists say, we should "impose capitalistic categories" neither on past collectives nor on present tribal collectives (Cunningham forthcoming). There is a widespread aversion among (ethno-)archaeologists to suggest or make believe that archaic humans or tribal communities might have had similar or analogous economic motives as most ordinary people in commercialized modern societies. Consuming modern economic theories might distort past inclinations and aspiration by assimilating them to those of "*homo oeconomicus*" or might even, *horribile dictu*, support capitalism.

There looms some wishful thinking in the intellectual background of archaeology. Archaic humans *should* be different from modern economic agents as they shared, feasted, gifted, worshipped, loved, *etc.* They *should* not have been as greedy and selfish as most of members of society are today. They *should* have been more disinterested in profit-making, returns of investments, accumulation, hoarding, wealth, luxury, *etc.* than "we" (or most of us) are. They *should* have performed their activities more in a reciprocal common mode and out of solidarity, gifting, communing, sharing, *etc.* Their lives *should* provoke us to think about non-commercialized modes of production and exchange. Archaeology should decipher that post-commercial ways of life are within reach. Such moral motives are hard to falsify.

1 I dislike the term "prehistory" since human history didn't start with the invention of scriptures. In EEE, I adopted the usual terminology, because I wished to avoid terminological dispute. I also dislike the "lithic" terminology which was coined in the dawn of modern archaeology. Here, I feel free to favor the term "archaic" for denoting human history before ancient times (roughly 800 BCE).

Epistemological concerns and moral reluctance often blend into each other. This twofold ambivalence against economics might result in an epistemological paradox: We should see humans in prehistoric archaeology as economic agents, but should see them not as economic agents, as modelled in economics. This paradox can, of course, be resolved by claiming that "their" economic agencies (motives, incentives) are different from "ours".

This resolution, however, is too quick and, on reflection, comes at a prize. It requires to compare different types of economic agencies in different periods of history which must be stylized and typed. One may argue that economic activities in archaic, ancient and most pre-modern times have been *embedded* in spiritual belief systems ("worldviews"), while they have become disembedded in modern industrial societies which are dominated by pure economic cost-benefit-calculations, efficient allocation, and monetization. But is this generic disembeddedness-claim correct? No, since contemporary economics assumes that most real persons perform *bounded* rationality. The analyses of bounded rationality show that modern agents accept not only legal, but also cultural, moral, environmental, and sometimes even religious constraints on economic activities (Wheeler 2018). In experimental settings, unfair solutions are often discarded, even if one profits by them. To many agents, satisficing behaviour is a reasonable alternative to maximizing. Even modern persons donate, share, perform gifting, reward favours, make presents *etc.* Decency matters in economic affairs. On reflection, the abstract dichotomy "embedded *versus* disembedded" isn't convincing. There is, however, a grain of truth to assume that there are grades of disembeddedness growing on the trajectory to modernity. Economics has been stylized in its intrinsic rationality in modern times.

The argument shows that conceiving, modelling, typing and comparing economic activities throughout history can't escape economics, but, by way of reflection, immerses deeper into it. If, for instance, archaeologists distinguish three types of capital (Borgerhoff Mulder *et al.* 2009) in archaic communities:

a. embodied capital (health, physical fitness),
b. social capital (offspring, friendship, bonding, loyalties) and
c. material capital (possessions, belongings),

one may ask whether archaic humans wished to maximize their utility in their overall bundle of capital, given trade-offs, and risks between the different types.

If economics is inescapable, it might be a better strategy to *liberate* prehistoric archaeology from its ambivalent aversion against modern economics. The reluctance against economic theories, concepts and models might be relieved if a philosophical claim can be made in favour of using modern economic theories in prehistoric archaeology. This would not deny epistemological caution in doing so. According to EEE, it is evident that all theoretical investments in prehistorical archaeology are hypothetical, abductive, and open for revision. So are economic ones.

MARX'S ARGUMENT

The "liberation"-claim is supported by Marx. Marx himself was not reluctant to apply modern economic concepts to past societies. He was rather demanding in this respect, as he wrote:

"*Die bürgerliche Gesellschaft ist die entwickeltste und mannigfaltigste historische Organisation der Produktion. Die Kategorien, die ihre Verhältnisse ausdrücken, das Verständnis ihrer Gliederung, gewährt daher zugleich Einsicht in die Gliederung und die Produktionsverhältnisse aller [! KO] der untergegangenen Gesellschaftsformationen. […] Die bürgerliche Ökonomie liefert so den Schlüssel zur antiken etc.*"

(Marx 1859, MEW 13, 636)

To Marx, modern economics is key to understand past economies because it refers to the most advanced economic order in human history. Capitalistic modes of commodity production, investments in capital, division of labour, surplus generation, commerce on markets, crediting and finance *etc.* have reached an unprecedented level of complexity which must be addressed in economics. If so, modern economics shall bring historians in a better position to understand and explain less-complex ways of performing economic activities. Of course, Marx supposes progressive historical stages of economic complexity and believed that a higher developed stage of original egalitarianism ("*Urkommunismus*") might return after the end of class societies (Ott 2023, 91–105). To Marx, humankind must proceed through different class societies until social inequality peaks under capitalistic modes of production. This final peak should collapse and egalitarian modes of production and consumption would be restored on a high level of productive forces.

To Marx, we are in a better position to understand feudal, oriental, ancient, and archaic modes of economic life because we live in and experience a commercialised

order of production, labour, consumption, exchange, investments, credits, taxes, monetary policies, *etc.* Modern economic life since the 15th century CE itself constituted, first, economically educated mindsets (as in merchants) and, second, "classical" economics as a theoretical enterprise (Smith, Ricardo, Marx, Mill, Jevons, Walras, among others). More than 140 years after Marx' death in 1883, his argument holds *a fortiori* because the scope of economic theories has been widened throughout the 20. century (see next section).

I endorse Marx' licence to invest economic concepts and theories into prehistoric archaeology. It's even more than a mere licence. It commits archaeologists to make specific theoretical investments. EEE follows Marx. Thus, EEE is not in line with approaches that refuse to apply modern economic concepts (models, theories) to past economies.

Following Marx implies that the economic theory of the "*Capital*" (Marx 1867) is only one modern economic theory among many others. Is this highly specific theory well-suited to become a theoretical investment to understand and explain archaic patterns of economic behaviour? No, because Marx conceives his (structuralist) theory of the ruling law of capitalism ("*Bewegungsgesetz*") from the theoretical core of a "cellular" analysis of the value-form of commodity ("*Wertform der Ware*") which leads Marx to the critique against "reification" ("*Verdinglichung*"), "fetishism" and "alienation" ("*Entfremdung*") being implied in the pure form of commodity (which is different from the exchange value ("*Tauschwert*")). To Marx, the contradictions of capitalism (as between labour and capital) are, as in a nutshell, also implied in the form of commodity itself.

Commodity production has been, however, not the primary mode in archaic modes of production. Domestic modes of production are not specialized on commodity production. Commodity production is specific and essential for capitalism and their might have been commodities also in archaic times (long distance trade, even slave markets). Commodity production, however, does not dominate archaic economies. A theory which focusses the very logic of capitalistic commodity production does not address the specific modes of archaic economies.

Therefore, Marx' argument in favour of theoretical economic investments is compatible with the rejection of the type of economic theory as presented in "*Capital*". Archaeologists and historians, of course, might investigate how commodity production emerged within domestic modes of production and, later, became dominant in the course of economic history and terminated in commodity production on a global scale. In the book Epistemology, Economics, and Ethics (Ott 2023, 163), I present a simple scheme that might be applied to the logic of growth within commodity production, terminating in the effects of large-scale production.

THE BROAD SCOPE OF ECONOMIC THEORIES

We are not disrespectful against archaic people if we take them seriously as self-conscious economic agents and try to understand and explain "their" behaviour with the help of "our" economic theories. *Given the plurality of contemporary economic theories, one can consume different specific economic approaches for theoretical investments within the paradigm of historical materialism in the spirit of the reflective turn (sensu ROOTS).* It seems likely that one needs the full scope of contemporary economic approaches to understand the Neolithic transformation from foraging towards actual economic life, as in ancient cities. Historical materialism can and should take account of a plurality of economic theories that have been proposed in recent years, such as behaviour economics, welfare economics, ecological economics, household economics, institutional economics, cultural economics, neuro-economics, behavioural economics, *etc.*.

This is to say, archaeologists should not shy away from economic theories out of moral or political aversions against globalized liberal market economies. Archaeology should better endorse this theoretical pluralism which has challenged and transformed the doctrine of neo-classical micro-economics of personal utility maximization ("*homo oeconomicus*"). Economics should not be identified with this specific theoretical doctrine being based on axioms. Given the plurality of contemporary economic theories, comparing and applying them with respect to prehistoric archaeology might become a playful intellectual enterprise. One can do so in the spirit of Graeber and Wengrow (2021) without commitments to "anarchism".

Economic TI may either stem from orthodox or from heterodox modern economic theories. "Orthodox" are Smith, Ricardo, Gossen, Jevons, Walras, Keynes, and Sraffa. "Heterodox" are Mauss, Bataille, Marcuse, and contemporary Degrowth-economics (see critical review on degrowth economics in Savin and van den Bergh 2024). I leave it open whether the economy theory of Marx, as given in the "*Capital*", is orthodox or heterodox. It is perfectly reasonable to make TI based on heterodox theories, but one should not dogmatically stipulate that heterodox theories in general better apply to archaic modes of life. It is true that cultural anthropology often favours heterodox economics theories, but

this does not indicate that explanatory potentials of heterodox theories are always superior. It is a "great" open question: May we better understand and explain economic life in archaic societies if we invest current orthodox or heterodox economics? Let's open a "great" theoretical contest between orthodox and heterodox economic theories in archaeology!

ECONOMIC REGULARITIES

Such contest requires a close look on how economic theories are conceived. The first economic theory was conceived by Aristotle. Aristotle distinguished two kinds of economies:

a. *household economies* that were close to a domestic mode of production (*oikonomia*) and
b. *market economies* being performed in order to make a profit in terms of money (*chrematistike*).

Households are the realm of use value, while exchange values are traded on markets.[2] The merchant might be primarily interested in exchange value, while the consumer takes an interest in use value. To Aristotle, *oikonomia* is restricted by the boundaries of a household. Thus, it is a "natural" domestic mode of economic life (*sensu* Sahlins 1972). In contrast, the market-driven *chrematistike*, does not have intrinsic limits, as it is always good to earn another unit of money (gold, silver). Thus, to Aristotle, *chrematistike* (making money) has no intrinsic measure (= limit) ("*Maß*") and is therefore without limits and, as such, "unnatural".[3] Aristotle can be seen as founding father of household economics which might be attractive for theoretical investments on explaining the domestic mode of production.

Modern economic theories have been conceived from John Locke and Adam Smith onwards (see Smith 1776). They focus upon the market economy which replaced feudal agrarian modes of production. Individual economic agency, cultural specifications (environment, religion, social stratification *etc.*) and general regular patterns of economic activities resemble the three-fold structure of most modern economics. Georg Wilhelm Friedrich Hegel (1821, § 189) praised economics ("*Staatsökonomie*") since economics reveals law-like regularities within the random multitude of singular economic activities with cultural settings. To Georg Wilhelm Friedrich Hegel, the appearance of random multitude is "governed" by underlying general regularities.

Economics presumes to decipher general patterns or regularities ("laws") out of the multitude of individual economic activities. Economic laws are not natural laws, but general patterns of economic regularities which can be observed (and tested) in particular societies. Such economic ambitions of revealing law-like regularities are of high relevance for archaeology, since they might be "underlying" the layer of historical particularities. It might also be the case that regularities are camouflaged (made invisible) by morals and religion, but might be detectable to economists. Such regularities may find always exceptions in specific cultures, since they are different from natural laws. Economic regularities are conditional as the rest upon an "if-then"-relation. Candidates for general regularities are:

1. The regularity of opportunity costs. There are trade-offs and opportunity costs as long as there is scarcity. A choice in favour of A costs B. This law holds for presents, donations, and credit. It is conditional on scarcity of resources. If economy comes to mind, economic choice is implicitly about opportunity costs.
2. The marginal rate of utility is declining with regard to specific goods (Gossen 1888). This regularity tells not to wish to have more of the same. It teaches a meta-preference for a heterogeneity of goods. The regularity is conditional on the experienced value of an additional unit of the same good. Economics teaches marginal thinking.
3. Offer and demand regulate prices on markets. The regularity of diminishing demand tells that demand decreases *ceteris paribus*, if prices increase. The regularity is conditional on free trade and the existence of markets as mode of exchange (Karatani 2014).
4. Property rights are necessary within civil modes of exchange. Commons are a type of collective

2 Economy modelling often starts with two persons ("producers") who own one specific good (grain, fish, oil, *etc.*). In the background, there is a Lockean assumption that they have acquired the good by their own labour. Because they prefer a bundle of multiple goods over a high amount of a single good, they start exchange. Far later, Adam Smith assumed a basic human inclination to barter, truck, and trade.

3 Karl Marx (1867, 167) quotes Aristoteles at a crucial point in his pure commodity analysis which results in the statement: "*Die Bewegung des Kapitals is daher maßlos*".

property rights. The regularity is conditional on peaceful and civil exchange in contrast to open access, raiding and plunder.

5. „Invisible-hand"-regularity. If there is free economic agency, division of labor, and trade, economic interactions become coordinated and generate more wealth in the longer run. Self-interested agents produce growing public wealth. Private vices of egoism (= "self-interest") turn into public virtues of wealth generation by which most persons are benefitted in the longer run. This Smithian regularity is, of course, highly contested.

Archaeologists may adopt these and other proposed regularities for hypothesis formation with respect to specific spatial locations and temporal periods.

CONCLUSION

This contribution to this *Festschrift* intends to bring economics as "*fröhliche Wissenschaft*" ("*la gaya scienza*") *sensu* Friedrich Nietzsche (1886) (translated as: "gay science", "joyous science", "joyful wisdom") into prehistoric archaeology. This idea does not teach archaeologists anything new but wishes to liberate them from the bad moral-political gut feeling if they invest more orthodox economic theories into archaeology. The idea entails Marx's argument, offers a broad scope of theories, proposes a contest between orthodox and heterodox economic theories and consumes presumed regularities for hypothesis formation. Other claims of how to invest specific economic theories into archaeology are welcome. This "economy-as-joyous-science-in-archaeology"-approach presumes to be in line with the economic-political spirit of Johannes. And, last but not least, with his great humour.

REFERENCES

Borgerhoff Mulder, M., Bowles, S., Hertz. T., Bell, A., Beise, J., Clark, G., Fazzio, I., Gurven, M., Hill, K., Hooper, P.L., Irons, W., Kaplan, H., Leonetti, D., Low, B., Marlowe, F., McElreath, R., Naidu, S., Nolin, D., Piraino, P., Quinlan, R., Schniter, E., Sear, R., Shenk, M., Smith, E.A., von Rueden, C. and Wiessner P., 2009. Intergenerational wealth transmission and the dynamics of inequality in small-scale societies. *Science* 2009 26(5953), 682–688.

Cunningham, J., forthcoming. Analogical Reasoning and the New Materialism. *In*: V. Arponen, K. Ott and A. Ribeiro, eds. *Discourses on Modernity*. Leiden: Sidestone.

Gossen, H.H., 1888. *Entwicklung der Gesetze des menschlichen Verkehrs und der daraus fließenden Regeln für menschliches Handeln*. 2nd edition. Berlin: Prager.

Graeber, D. and Wengrow, D., 2021. *The Dawn of Everything. A New History of Humanity*. New York: Farrer, Straus and Giroux.

Hawkes, C., 1954. Archaeological Theory and Method: Some Suggestions from the Old World. *American Anthropologists* 56(2), 155–168.

Hegel, G.F.W., 1821/1970. *Grundlinien der Philosophie des Rechts*. Werkausgabe 7. Frankfurt/M.: Suhrkamp.

Karatani, K., 2014. *The Structure of World History. From Modes of Production to Modes of Exchange*. Durham: Duke University Press.

Lowe, A., 1965. *On Economic Knowledge*. New York: Harper and Row.

Marx, K., 1859. *Zur Kritik der Politischen Ökonomie*, MEW 13, Berlin: Dietz.

Marx, K., 1867. *Das Kapital*. Erster Band, MEW 23. Berlin: Dietz.

Nietzsche, F., 1886. *Die Fröhliche Wissenschaft*. Werke Bd. II (ed. Schlechta). Frankfurt: Ullstein, 281–274.

Ott, K., 2023. *Epistemology, Economics, and Ethics*. Leiden: Sidestone.

Sahlins, M., 1972/2004. *Stone Age Economics*. London: Routledge.

Savin, I. and van den Bergh, J., 2024. Reviewing studies of degrowth: Are claims matched by data, methods and policy analysis? *Ecological Economics* 226, 108324.

Smith, A., 1776/1976. *An Inquiry into the Nature and Causes of the Wealth of Nations*. Oxford: Oxford University Press.

Smith, K., 2012. From dividual and individual selves to porous subjects. *The Australian Journal of Anthropology* 23, 50–64. https://doi.org/10.1111/j.1757-6547.2012.00167.x

Taylor, C., 1989. *The Making of the Modern Identity*. Cambridge: Harvard University Press.

Wheeler, G., 2018. Bounded Rationality. *In*: E.N. Zalta, ed. *The Stanford Encyclopedia of Philosophy Fall 2020 Edition*. https://plato.stanford.edu/archives/fall2020/entries/bounded-rationality/

The Pipe and the Bell
Objects and Networks in Light of Dyadic and Triadic Relations

Artur Ribeiro

KEYWORDS: *Material culture, triadic, diadic, relations, networks*

Abstract

Despite the popularity of the posthumanisms in archaeology, and material culture studies in general, supporters remain divided as to what element the posthumanisms should prioritize in their analyses: objects or networks? From a metaphysical standpoint, it is not clear whether objects emerge from networks, or whether networks are an outcome of the aggregation of objects.

The aim of this paper is to demonstrate that this problem does not concern metaphysics at all but rather with the logic of relations. More specifically, this paper argues that humans and non-human objects can engage in two types of relations — a phenomenological relation, which requires a *de facto* physical connection between humans and objects, and a normative relation, which requires a social agreement between two social actors and mediation of an object. This will be exemplified through two objects: the pipe and the bell. More importantly, the paper also demonstrates how phenomenological and normative relations align with Charles Sanders Peirce's notions of dyadic and triadic relations. The paper concludes with some comments on what these ideas entail to material culture studies.

Zusammenfassung

Trotz der Popularität des Posthumanismus in der Archäologie und den Studien zur materiellen Kultur im Allgemeinen sind sich die Befürworter uneins darüber, welchem Element der Post-humanismus in seinen Analysen den Vorrang geben sollte: Objekten oder Netzwerken? Von einem metaphysischen Standpunkt aus ist nicht klar, ob Objekte aus Netzwerken entstehen oder ob Netzwerke ein Ergebnis der Ansammlung von Objekten sind.

In diesem Beitrag soll gezeigt werden, dass dieses Problem gar nicht die Metaphysik betrifft, sondern die Logik der Beziehungen. Genauer gesagt wird argumentiert, dass Menschen und nicht-menschliche Objekte zwei Arten von Beziehungen eingehen können — eine phänomenologische Beziehung, die eine faktische physische Verbindung zwischen Menschen und Objekten voraussetzt, und eine normative Beziehung, die eine soziale Vereinbarung zwischen zwei sozialen Akteuren und die Vermittlung eines Objekts erfordert. Dies wird anhand von zwei Objekten veranschaulicht: der Pfeife und der Glocke. Darüber hinaus wird aufgezeigt, wie phänomenologische und normative Beziehungen mit Charles Sanders Peirce' Begriffen der dyadischen und triadischen Beziehungen übereinstimmen. Der Beitrag schließt mit einigen Bemerkungen darüber, was diese Ideen für die Studien zur materiellen Kultur bedeuten.

INTRODUCTION

Archaeological theory has witnessed very interesting developments in the last twenty years or so: it has abandoned postprocessual archaeology, and its associations to interpretation, semiotics, and subjectivity in favour of new ideas concerning materiality, relations, and ontology. These ideas, which we shall call the posthumanisms for simplicity's sake, marked the rise of a new paradigm in archaeological theory or, as some have preferred calling it, a new "turn" in archaeology (Webmoor 2007).

The slow demise of postprocessual archaeology started in the early 2000s: it was expressed in a waning interest in interpretative practices and a return to just "doing archaeology" (Shennan 2007, 220). However, during this same time many archaeologists started preparing the groundwork for a new paradigm, one that focused on a "return to things" (Olsen 2003; Shanks 2007; Webmoor 2007; Witmore 2007; Webmoor and Witmore 2008). This desire for a return to things has, in the meanwhile, given rise to diverse set of ideas and approaches, such as relational archaeologies, object-oriented approaches, and symmetrical archaeology, which some authors have designated collectively as the posthumanisms. Underlying the immense variation in ideas are some common themes that unite the posthumanisms, most important of which are the de-centring of the human subject, the rejection of unhelpful modernist dualisms (*e.g.* nature/culture, subject/object, mind/matter), the recognition of the relational nature of social life, and of course, the realization that things are more than just backdrops in the life of humans (Ribeiro 2019, 26).

In archaeology, the posthumanisms have been expressed in various ways. One of those expressions is through the respect and care for objects, represented in philosophy by scholars such as Martin Heidegger and Graham Harman (Heidegger 1962; Harman 2002) and in archaeology by Bjørnar Olsen (Olsen 2003; 2010) and Matt Edgeworth (2016). Also central to certain posthumanist positions is the idea of how these objects interrelate and form networks[1] with one another, this is represented in philosophy by thinkers such as Bruno Latour and Gilles Deleuze (Deleuze 1997; Deleuze and Guattari 1983; 1987; Latour 1999; 2005), and in archaeology by thinkers such as Christopher Witmore, Tim Webmoor, Chris Fowler, Oliver Harris, and Ian Hodder (Webmoor 2007; Witmore 2007; Webmoor and Witmore 2008; Hodder 2012; Fowler 2013; Harris 2014; Fowler and Harris 2015), to name only a few.

So, in oversimplified terms, it can be said that the posthumanisms prioritize either objects or networks. When discussed separately, objects and networks do not seem raise too many objections. Problems arise when it comes to explaining how objects and networks interact. Thus, the first aim of the current paper is to clarify how best to understand this interaction. The second aim is to demystify several concepts deriving from language philosophy and demonstrate how social norms remain very important for the understanding of different types of networks. Finally, the third aim is to demonstrate how these ideas are of relevance to the analysis of material culture in archaeological studies. In order to follow these aims, it is necessary to identify where the problem concerning objects and networks lie.

PROBLEMATIZING MATERIAL RELATIONS

When it comes to objects and networks, the concept of "object" has been quite difficult to understand, with most authors simply not defining it and using the concept interchangeably with "thing", which also remains somewhat poorly defined (*e.g.* Latour 1999, 176 cited in Olsen *et al.* 2012, 6). In contrast, "network" is a concept that tends to be more explicit and usually relies on a more intuitive and practical definition: a network is a collection of interrelated items (Knappett 2011, 20). Naturally, this short definition does not provide much information concerning how archaeology engages with networks, which is why in the last decades we have witnessed several proposals as to what networks truly represent and how they should be applied (*e.g.* Olsen *et al.* 2012; Watts 2013; Knappett 2013; Hodder and Mol 2016; Hamilakis and Jones 2017).

Underlying these two concepts is a metaphysical question that is often acknowledged yet few people have found a satisfactory answer to: are networks formed of objects, or are objects formed by networks? This is one of the central paradoxes of the posthumanisms: on one hand it is argued that objects pre-exist networks, on the other it is argued that objects emerge from networks (Fowler and Harris 2015, 129). Object-oriented theorists tend to prioritize objects themselves because they recognize objects as having an essence that transcends that of their relations (Harman 2014). Furthermore, some scholars also argue that objects have inherent properties that help us understand them quite well but are usually ignored (Ingold 2007). But focusing exclusively on objects and their properties and essences is rather limiting and hardly explains

1 The term "network" is used as a generic reference to interrelated groups of items, regardless of whether they are enmeshments, entanglements, or assemblages. Overall, the paper will be focusing on networks as discussed by some posthumanist strands, that is to say, on a more theoretical level. There is also a wealth of literature and studies based on network theory that is considerably less theoretical and more pragmatic (Knappett 2011; 2013; Brughmans *et al.* 2015; Collar *et al.* 2015).

the variety of phenomena occurring in the world (Tilley 2007, 18). As many theorists have pointed out, it is considerably more fruitful to recognize the metaphysical presence of objects and their properties and how these are articulated *within networks* (*e.g.* Knappett 2007; Watts 2013). Network theory requires recognizing both objects and their relations, or to put it in other words, a network must involve another ontological category, which is not the network itself. A network has to be a composition of something other than a network, it has to be a grouping of *objects* (Bennett 2012, 227). This reasoning, however, does not actually solve the metaphysical question raised above: are networks made of objects or are objects made of networks?

This is where posthumanists have remained unabashedly cryptic: as long as one recognizes that objects (human or not) interact and form networks, that is all that matters, because reality is ultimately and irreducibly relational. However, from a pragmatic point-of-view, these platitudes are rather unsatisfactory — it leaves our understanding of objects and networks a little too vague and imprecise, in both social and material culture analysis. Let me illustrate this with an example: if a library is a network, what are the objects necessary to form this network? Books, librarians, shelves? But if we remove all the books from a library, would it still be a library? If no, then why are books associated to libraries in the first place? If yes, then how many books are necessary to form a library?

It might come as a surprise that very similar questions could have been asked of postprocessual archaeology. Let us try to understand the problem in light of an archaeological example: is it possible to understand a funerary ritual at an archaeological site by only analysing one grave that exemplifies the ritual? A supporter of postprocessual archaeology would answer that the funerary ritual is part of a context and to truly understand the ritual one needs to also understand other social aspects concerning the people who conducted the funerary ritual. While this is a sensible way of reasoning, the word "context" is used in archaeology somewhat liberally (Ribeiro 2016, 230). For some postprocessual archaeologists, the solution to this problem is to employ a hermeneutic method that allows researchers to form contextual "wholes" as more evidence is uncovered (see Hodder 1999, 43). But what are these "wholes" and when does something become a whole? For instance, if we uncover 30 graves that follow the same funerary ritual at an archaeological site, it seems safe to say that excavating the 31st grave will provide no more information than what was known before. Similarly, it can be argued that while some new evidence can indeed alter and improve our understanding of the funerary ritual, if evidence of pottery is found at the same site, but outside of the graves, there really is not much one can say about the relation between the pottery and the funerary ritual.

Similarly, we can ask the same questions when it comes to objects and networks. Objects form networks but once again where do they begin and where do they end? Gilles Deleuze and Felix Guattari talk about networks as open-ended (1987), which can be confusing from a metaphysical standpoint. Ultimately, there does not seem to be among the posthumanists a good explanation with regards to when something stops or starts becoming part of a network. This problem is not new and has been recognized in metaphysics as a problem concerning mereology, that is to say, a problem of knowing when something is a part and when it is a whole (Van Inwagen 1987). If we abandon metaphysical rigour, it could be stated that objects are simultaneously parts and wholes. For instance, Christopher Witmore states that things are things and things are assemblages (2014) — the problem with this statement is that it violates too many laws of metaphysics, namely the laws of contradiction and of excluded middle (Boole 1854; Meillasoux 2008).[2] If we accept Christopher Witmore's description of objects and relations, then anything and everything is simultaneously an object and a relation at the same time at all times, *ad infinitum*. Given this problem, there has been a downplaying of the importance of relations and networks by certain philosophers who have argued that one should focus more on objects themselves, rather than on their relations (Harman 2012; Morton 2012). There is much merit to this argument, as Graham Harman explains

"*if all objects were completely determined by the structure or context in which they resided, there is no reason why anything would ever change, since a thing would be nothing more than its current context.*"

(Harman 2012, 191)

2 These laws are part of what are called the 'Laws of Thought" (Boole 1854). The concept of object, as we commonly understand it, cannot exist without these laws. The first law, the law of identity, establishes that an object is what it is; the second law, the law of contradiction, states that an object cannot simultaneously be what it is and what it is not; and the third law, the law of excluded middle, states that an object cannot be what it is and something else at the same time.

More than just an issue concerning metaphysics, understanding if whether an object is part of something or whether it is a whole has affected all types of social sciences, from social theory to language studies, to anthropology, to philosophy, and so on. So, what is the solution? As is common in matters such as these, sometimes we frame the problem in inadequate ways. The problem relates not to metaphysics — but rather in *recognizing different types of relations*.

DIFFERENT TYPES OF RELATIONS

It was language philosophers who first recognized that there were problems when analysing things either in its constituent parts or in terms of totalities (*e.g.* Quine 1951). They were also the first to identify an adequate solution to it. The most elegant version of this solution comes from Vincent Descombes (2014). As described earlier in the paper, in language philosophy the problem does not involve networks and objects, but semantics. Here, the two opposing positions are semantic atomism and semantic holism. Although there are several different versions, all of which are quite complex, semantic atomism presupposes that meaning of a language can be broken down into signs, all of which retain meaning independently. Semantic holism argues the opposite, claiming that the larger totality of a language system is what gives meaning to signs.

Jerry Fodor and Ernest Lepore have put forward a very commendable critique of semantic holism (1992). If semantic holism is true, then people from different language backgrounds would never be able to understand each other at all. Why is that? If one person speaks French and another speaks Japanese, then it means that each of these people operate with holistic systems that only make sense to themselves. For example, if someone asks both these people if the sky is blue, the French speaker utters *"oui"* and the Japanese speaker utters "*hai*" (はい). Common sense would dictate that *"oui"* and "*hai*" both mean "yes". The problem with semantic holism is that they cannot both mean "yes". If *oui* derives its sense from its relation to other signs in the French language, and *hai* respectively from Japanese language, then logically *oui* and *hai* must have different meanings. In conclusion, a Japanese speaker would never be able to understand a French speaker, unless one of them adopts the other's language entirely.

Obviously, since tourism in both France and Japan operate quite smoothly, we must assume that it is, in fact, possible for the French and Japanese speakers to understand each other at a very basic level. Thus, the problem must be semantic holism itself as Jerry Fodor and Ernest Lepore argue. For these authors, it must be possible for signs to exist in more discrete fashion, one that does not depend on a totality, and in that sense Jerry Fodor and Ernest Lepore suggest thinking of semantic signs as atomistic *dyadic relations* (1992, 3). What does this mean? For Jerry Fodor and Ernest Lepore, signs cannot be reduced to individual units, but they can be reduced to at a least a relation of two signs.

This is a very coherent way of thinking about meaning, but as Vincent Descombes has figured out, it is *incorrect*. As Vincent Descombes argues — signs need at least three elements: one human, another human, and the sign itself (2014, 116–118). The use of a sign is built upon *triadic relations*. The problem with how Jerry Fodor and Ernest Lepore discuss semantics is based on the false opposition in which meaning either has to be based on *individual signs* or on *all signs*, when meaning is best understood as dependent on its *normative usage*.[3] Thus, the word "yes", "oui", or "hai", gain their meaning through their correct and understandable usage in daily life, or in other words, their meaning is normative. Furthermore, it is through norms that we can understand other social relations. For example, to understand being a spouse requires more than just a relation between a husband and wife, it also requires another person — the unmarried person. As Bourdieu has shown (1991, 125), marriage is a rite of institution — it is an arbitrary boundary separating married people from unmarried people. In order for this to be possible, both spouses need to agree to marry, *but the unmarried person also needs to recognize the marriage by accepting his or her own status as "unmarried"*. In a way, marriage is still holistic in that it involves more than the atomistic relation between two spouses, it involves the objective recognition by a society (Descombes 2014, 117). This is very important because without a normative element there could be no difference between a dating couple and married couple. Once again, this does not mean that these rules are "in the head" of people, but rather, in the actual practices, that is to say, *in the rules*

3 This is what Ludwig Wittgenstein (2009 [1953], §116) meant when he stated: "*What we do is bring words back from their meta-physical to their everyday use*".

themselves. One cannot simply imagine oneself as married – one actually has to engage in the processes required for society to recognize the marriage.

It has been noted by archaeologists how Charles Sanders Peirce's work on semiotics, especially his work on triadic relations, is what has allowed us to understand how meaning is embedded in the world, and not an immaterial element floating in the heads of people (*e.g.* Preucel 2006; Watts 2008; Cipolla 2017; Crossland and Bauer 2017). However, what has yet to be done by archaeologists is understand semiotics in terms of normativism and consequently, why "three" is such an important number in understanding norms.[4] As Vincent Descombes explains, social behaviour is normative because it is *mediated* (Descombes 2004). For example, to avoid committing crimes is a type of behaviour that only makes sense in a context where there are other people. If a person is left alone on an island, there is no reason for that person to avoid committing crimes — because the concept of crime loses all meaning. Granted, a person alone on an island can establish rules of behaviour, but failure to follow those rules would not result in the person becoming a criminal. It would be impossible for a person alone on an island to be a criminal. This is because a human cannot be simultaneously an enforcer of a norm, and the subject acting according to the norm — as this would lead to the paradoxical situation of having to divide oneself into two entities, like being a master and slave at the same time (Descombes 2004). Thus, norms are dialectic in that they must involve two living entities in different social positions — and to these two living entities we add the missing element: the object[5] that mediates the behaviour between them.

So how does this impact the posthumanisms and affect our perspectives of material culture? I will be focusing exclusively on actor-network theory, although these ideas apply quite broadly to other network theories. At its most basic, Bruno Latour's actor-network theory is used to describe relationships between different social actors. It frames social action at a much smaller scale, a scale that provides a more realistic picture of how social processes actually occur. This allows actor-network theory to be a realist way of describing the world, as it forces the scholar to describe the way the world is composed independent of the mind (Harman 2011, 53). What the Latourians reject are those universal concepts that have no real substance, such as "capitalism", "the middle-class", or "paradigm", which fail to really capture the world, and which constrain the researcher into illusory research domains. Overall, actor-network theory aims not towards the explanation of social processes, but as an ontology of society itself (Latour 1996, 369). As an ontology, actor-network theory is attached to the metaphysical principle that humans and non-human objects are ontologically indistinct (Witmore 2007, 547), also known as the principle of symmetry. Concomitantly, the capacity to act (agency) cannot be an *a priori* element of either humans or non-human objects since agency is drawn from constellations of both humans and non-humans (Van Oyen 2015, 65). By recognizing social life as involving more entities than just humans, actor-network theory allows the dissolution of subject-object relations where only humans could be active and act towards passive objects (Webmoor and Witmore 2008).

I will not engage in a general discussion of actor-network theory, but frame it in light of the problem described in the previous section: where and when does an actor-network start an end? Let us follow Bruno Latour's most famous example, that of a gunman:

> "*It is now possible to shift our attention to this 'someone else,' the hybrid actor comprising (for instance) gun and gunman. We must learn to attribute-redistribute-actions to many more agents than are acceptable in either the materialist or the sociological account. Agents can be human or (like the gun) nonhuman, and each can have goals (or functions, as engineers prefer to say).*"
>
> (Latour 1999, 180)

The constellation of the gun and the gunman forms a hybrid actor, but is this hybrid actor a "whole" in itself, or is it a "part"? This is very unclear. On one hand, it would seem that a human plus a gun would be a network unto itself, a "hybrid actor" as Bruno Latour calls it, but on the other hand Bruno Latour also states that these actors, such as the gun and human, are integrated into larger networks, which contain more actors (Latour 1991, 110; 1999, 181). Thus, there is no process or mechanism within actor-network theory that allows a clear-cut identification of where networks start and end. Let us try to understand the problem at hand by using an example provided by Bruno Latour himself. In his book "*The Modern Cult of the Factish Gods*" (2010, 54–56), Bruno Latour comments on the relation between a smoker and a cigarette through a comic strip (Fig. 1):

4 Robert Preucel has provided a very decent explanation as to why the triadic system of Peircean semiotics is exceptionally better than the dyadic system of Saussure (Preucel 2006, 249–250)

5 It must be said that "object" need not to be a physical object *per se*, such as a hammer for instance. However, it needs to be empirical, such as sound or a visual sign.

Fig. 1. Source: "Le Club de Mafalda," no. 10 (Quino 1986, 22).

In this comic strip, Mafalda asks her father what he is doing, to which he replies that he is smoking a cigarette. Mafalda then replies that it looks to her that the cigarette is smoking him, which causes him to panic and destroy the cigarettes. For Bruno Latour, the idea of a subject-object relationship between the father and the cigarette is anathema because there simply cannot be a relation of subservience between an acting intentional subject towards a passive object, regardless of whether the subject is the father or the cigarette (Latour 1993). Ontologically, there can only be objects relating to other objects — but no "masters" with power over "servants" (Latour 2010, 56). What should the father have said? Bruno Latour suggests:

"*Yes, Mafalda, my daughter, I am effectively held by my cigarette, which makes me smoke it. There is nothing in this resembling a determining action, neither for it nor for me. I do not control it any more than it controls me. I am attached to it and, if I cannot hope for any kind of emancipation from it, then perhaps other attachments will come to substitute for this one (…).*"
(Latour 2010, 58)

For Bruno Latour, the solution is to simply describe reality without committing to an acting subject at all, what he calls a "middle voice" (Latour 2010, 56). In this type of description, what matters is the actual physical relation between the father and the cigarette. Additionally, this allows Bruno Latour to propose a way of describing the world which does not have to rely on rather vague immaterial concepts such 'purpose' or 'law of nature', and all the dualisms that derive from these concepts. The actor (or "*actant*" as Latour prefers to call them) is neither the father nor the cigarette, it is the network composed of both of them.

In a way, there are some similarities between Bruno Latour's ideas and those of phenomenology, which some posthumanists in archaeology have tried to combine (*e.g.* Olsen 2010; Olsen *et al.* 2012). Like in Bruno Latour's work, phenomenology has engaged in the rejection of dualisms and recovering the world of objects. Thus, it comes as unsurprising that phenomenologists, such as Maurice Merleau-Ponty (2014 [1945]), have also described the relation between human and objects in terms that are not too different from Bruno Latour. It must be noted that Maurice Merleau-Ponty, unlike Bruno Latour, still accepts subject-object relations, but not necessarily in a Cartesian sense. For Maurice Merleau-Ponty, the subject is a being in the world that is connected to other humans and non-human objects. For example, in "*Phenomenology of Perception*" he states that:

"*Not only have I a physical world, not only do I live in the midst of earth, air and water, I have around me roads, plantations, villages, streets, churches, utensils, a bell, a spoon, a pipe.*" (Latour 2014 [1945], 363)

With the relation of the human and the pipe, we are back at the topic of smoking. Now, I tried to understand what both Bruno Latour and Maurice Merleau-Ponty were trying to convey with their example (Fig. 2). So confronted with a pipe, I engaged in a situation where the pipe was filled with tobacco, is lighted, and smoked. At its most basic, *the process was a phenomenological one* — I had to physically engage with the pipe. The "hybrid actor" of me (human) plus pipe (non-human) can only exist if there is an *actual connection* between us. If the pipe remains unused in my drawer, then the hybrid actor ceases to exist. This connection has to be real and not imagined. Additionally, what matters is the phenomenological experience of smoking, not the purposive action of smoking, or as Bruno Latour would put it (2010, 56), the mastery of the smoker over the smoking pipe or *vice-versa*.

Fig. 2. The phenomenological experience between the author and a smoking pipe or the network of human + smoking pipe, also known as the hybrid actor 'smoker' (Photo: Artur Ribeiro).

Bruno Latour's actor-network theory and phenomenology works quite well in recognizing smokers, because of the necessary physical connection between a human and a cigarette or a pipe, but from the objects listed by Maurice Merleau-Ponty that I quoted above, there is one that sticks out for being *different* and which Maurice Merleau-Ponty and Latour have not described in appropriate detail: it is the bell (Descombes 2014, 288).[6] Unlike smoking a pipe, which involves two elements, *ringing a bell must involve at least three* — from a relational perspective, there has to be a bell ringer, a bell, *and another human (or perhaps an animal) who responds to the bell*. Whereas the relation between a smoker and cigarette is necessarily a *phenomenological* one, the relation between a bell-ringer, the bell, and the person who responds, is necessarily a normative relation. This is because the whole existence of a bell, such as doorbell, or a church bell, rests upon the agreement between two humans as to what the sound of the bell represents. At a house, ringing the doorbell is to indicate that there is someone at the door, which is the same as office desk bells, whereas in a church the bell can mean several things, like the start of service or to warn people of an upcoming funeral.

Ringing a doorbell is normative behaviour because the whole point of doing that is to signal the occupant of a house that someone is at a door. This is the normative function of the doorbell. This does not mean that this is the only thing a doorbell can do, but it is its *raison d'être*. So, if a person rings the doorbell because it sounds nice, this is only possible because one knows how doorbells operate, and where these can be found. Furthermore, even if a doorbell is rung when nobody is at home, the bell still serves its original function — it was rung with the assumption that someone was home. The norm is not answering the bell but understanding what its sound is supposed to signal.

6 'Bell' is understood here as a doorbell, a church bell, or an office desk bell.

MATERIAL CULTURE IN RELATIONS

We can now come to a clearer understanding of how these ideas can impact archaeology and material culture studies. From a phenomenological perspective, certain objects, such as pipe or a hammer, operate in terms of dyadic relations — a symmetrical relation that connects a human and an object. But if a hammer or a pipe is gifted to someone, we enter a new type of relation: a triadic one. In a letter to Lady Welby, Charles Sanders Peirce points out that dyadic relations are brute actions, but triadic relations contain a symbolic element, which are absent in dyadic relations (Peirce 1958, §331). What does this mean? Brute actions alone cannot account for our understanding of material culture, in the sense that if a hammer is gifted to another person, this hammer has to be recognized differently as if it were simply borrowed among carpenters in a workshop for instance. The physical act of one hand holding a hammer, passing it one to another hand, is not enough — we need to understand how these objects operated within triadic relations.

To answer the question posed earlier in the paper: are networks formed of objects, or are objects formed by networks? The best way to answer this question is to not focus on the objects or the networks *per se*, but on relations. What makes objects pre-exist or emerge from networks is precisely its relational status — a human being could definitely pre-exist a network and can be studied as an independent being (*e.g.* by biology) but a spouse for instance cannot, since a spouse exists precisely in virtue of its relation to another spouse and those who remain unmarried. What does this mean in terms of research into material culture? From a Peircean perspective, we can subdivide research into objects and networks into three large categories:

1. research into *monads* would entail the study of materials, that is to say, the study of objects and their material properties, as suggested by Tim Ingold (2007);
2. research into *dyads* would give priority to the phenomenological (*i.e.* physical relations) between distinct objects;[7]
3. and finally, there is the research into *triads*, which would be the *de facto* study of social relations (*i.e.* normative) between living beings and objects.

Let us think of this in light of gift-giving: according to Bjørnar Olsen, gift-giving can either be understood in a way where the gift itself, the object, is only incidental to previously established human social relationships (Gurevic 1992, 179 cited in Olsen 2010, 5–6). The other way of understanding gifts is to recognize them as fundamental physical objects without which gift-giving would be impossible (Pétursdóttir 2007, 61 cited in Olsen 2010, 61). The problem with how Bjørnar Olsen frames gift-giving is that a gift can only be two things: either it has to be completely marginalized, epiphenomenal, or secondary, or it has to be an essential element woven into the fabric of social reality — when realistically, it is neither of these two caricatured positions. A gift is not an actual object; there is no object on this planet that has the property or essence of "gift"; a "gift" can only be a gift when it is offered from one living entity to another entity. Additionally, a gift need not be a physical object; a massage, a kiss, a poem that is read out loud, a hug, *etc.* can also be gifts. In these latter cases, it becomes entirely possible for gift-giving to occur without the presence of a single physical object, except for the humans themselves. In conclusion, we cannot simply recognize gifts categorically as by-products of human relations or exclusively as physical objects, since this is a caricatured dichotomy that simply does not represent reality whatsoever.

It is entirely possible to understand gift-giving in terms of the physical relations, of how objects are produced, used, and transition from hand to hand, but also in terms of the *social norms* they answer to. In other words, material culture can be studied in terms of *dyadic and triadic relations simultaneously*. How does this actually work? A pipe and a bell are not stuck strictly within dyadic and triadic relations respectively; it is possible for a pipe to be within a triadic relation just as a bell can within a dyadic one. If a pipe is offered, for example in a peace pipe offering ritual (Brown 1953), it is part of a triadic relation; concomitantly, bells can be used as musical instruments, such as the Chinese *biazhong* (von Falkenhausen 1993), which can be played for self-enjoyment. Additionally, just because something is within a triadic relation, it does not mean that it cannot be in a dyadic relation, at the same time.

For instance, ancient Urartu is famous for its metalwork, and several bells dating to the Iron Age (8th century BCE) have been recovered from Urartian sites (Merhav 1991). These bells tend to be hexa- or octagonal

7 Vincent Descombes has also shown how the traditional empirical conception of causation as cause-effect can also be recognized as dyads (2001).

Fig. 3. Bell inscribed with the Urartian royal name Argishti (Source: The Metropolitan Museum of Art, New York).

in shape and have rectangular apertures on the sides (Fig. 3), although some do not have these exact characteristics (see Muscarella 1978). As stated above, the bell is usually a part of triadic relations, but naturally it can also be part of dyadic relations and in Urartu, the bell was probably part of several dyadic and triadic relations. Urartian bells are usually described as ornamental, since inscriptions on some of them mention that they are standard horse equipment (Merhav 1991, 80). Furthermore, these bells also usually come with inscriptions stating the bell (or the horse it was attached to) belong to a king, such as Argishti (Fig. 3). From this information alone, it is possible to recognize the way the bell is incorporated into several dyadic and triadic relations: first, the most standard dyadic relation is that which connects the bell with living beings that can listen to it, which were most probably humans and horses; second there is also the dyadic relation of the human who has to physically attach the bell to the horse harness; third, there is also the relation between the bell and the horse on which it is attached; fourth, in terms of triadic relations, we have the bell as ornament, possibly to highlight the importance and wealth of Argishti exemplified in figure 3 – in this case, the triad is composed of Argishti, the bell, and another person who either sees or hears the bell; and finally, there is also the possibility that the bell served to announce the presence of Argishti himself, which would mean that the horse (and its rider) was an official emissary of Argishti, making the bell, once again, a part of a triadic relation.

These possibilities do not exhaust the meanings the bell could have had in Iron Age Urartu. However, the fact that the bell could have had multiple meanings, depending on what relation it was in, does not necessarily entail that it had an infinite number of subjective meanings — since subjective meanings themselves require objective triadic relations, too (Descombes 2014, 286). Additionally, the study of material culture, following dyadic and triadic relations, does not preclude the study of objects in material terms. It is entirely possible to engage in material culture studies in terms of relations, but also with a focus on the "thingly" quality of objects (Ingold 2007, 9).

CONCLUDING REMARKS

As Hodder points out, it is not surprising that networks became a popular topic of study in an age marked by the rise of new network technologies (Hodder 2018, 43). That is the truth of most posthumanist ideas — they are a reflection of the times. Just as the computer HAL in Arthur C. Clarkes book "*2001 A Space Odyssey*" was a subconscious fear of how technology was taking over economic life, the posthumanisms represent a similar fear. But as with most things, posthumanisms might have gone too far. As Severin Fowles wondered, how was it possible for anthropologists to deny the Anthropos, for sociologists to deny society, and phenomenologists to deny perception (Fowles 2010)? Granted, in the social sciences, this turn towards objects was a response to the obsession with texts and meaning during the 1980s and 1990s, but the posthuman became a new obsession in itself, so obsessive at times that its arguments resembled fundamentalist dogmas rather than reasoned ideas (Ribeiro 2019).

Ultimately, the "textual turn" was not in any way wrong, nor are the "material turn" and the "relational turn" of the posthumanisms wrong either, but they are somewhat obsessive and dogmatic. What this paper has attempted to do is precisely to point that yes, of course, there are relations and objects in the world, but we cannot really understand them if we take a dogmatic approach that denies the existence of meanings, symbols, and above all, social norms between social beings.

REFERENCES

Bennett, J., 2012. Systems and Things: A Response to Graham Harman and Timothy Morton. *New Literary History* 43, 225–233.

Boole, G., 1854. *An investigation of the laws of thought, on which are founded the mathematical theories of logic and probabilities*. London: Walton and Maberly.

Bourdieu, P., 1991. *Language and symbolic power*. Cambridge: Polity.

Brown, J.E., 1953. *The Sacred Pipe: Black Elk's Account of the Seven Rites of the Oglala Sioux*. Norman: University of Oklahoma Press.

Brughmans, T., Collar, A. and Coward, F., 2015. *The connected past: challenges to network studies of the past*. Oxford: Oxford University Press.

Cipolla, C.N., 2017. Being and Becoming Stone. *Semiotic Review* 4, 1–14. https://doi.org/10.71743/en3wpt30

Collar, A., Coward, F., Brughmans, T. and Barbara, J.M., 2015. Networks in archaeology: phenomena, abstraction, representation. *Journal of Archaeological Method and Theory* 22, 1–32.

Crossland, Z. and Bauer, A., 2017. Im/materialities: things and signs. *Semiotic review* 4, 1–24. https://doi.org/10.71743/g9ckka16

Deleuze, G., 1997. *Difference and repetition*. London: Athlone.

Deleuze, G. and Guattari, F., 1983. *Anti-Oedipus: capitalism and schizophrenia*. Minneapolis. MN: University of Minnesota Press.

Deleuze, G. and Guattari, F., 1987. *A Thousand Plateaus: capitalism and schizophrenia*. Minneapolis: University of Minnesota Press.

Descombes, V., 2001. *The mind's provisions: a critique of cognitivism*. Princeton, NJ and Oxford: Princeton University Press.

Descombes, V., 2004. *Le complément de sujet: enquête sur le fait d'agir de soi-même*. Paris: Gallimard.

Descombes, V., 2014. *The institutions of meaning: a defense of anthropological holism*. Cambridge: Harvard University Press.

Edgeworth, M., 2016. Grounded objects. Archaeology and speculative realism. *Archaeological Dialogues* 23, 93–113.

Fodor, J.A. and LePore, E., 1992. *Holism: a shopper's guide*. Oxford: Blackwell.

Fowler, C., 2013. *The Emergent Past: A relational realist archaeology of Early Bronze Age mortuary practices*. Oxford: Oxford University Press.

Fowler, C., and Harris, O., 2015. Enduring relations: Exploring a paradox of new materialism. *Journal of material culture* 20(2), 1–22.

Fowles, S., 2010. People without Things. *In:* M. Bille, F. Hastrup and T.F. Sørensen, eds. *An Anthropology of Absence Materializations of Transcendence and Loss*. New York: Springer, 23–41.

Gurevic, A., 1992. Wealth and gift-bestowal among the ancient Scandinavians. *In:* J. Howlett, ed. *Historical anthropology of the Middle Ages*. Cambridge: Polity Press, 177–189.

Hamilakis, Y. and Jones A.M., 2017. Archaeology and Assemblage. *Cambridge Archaeological Journal* 27, 77–84.

Harman, G., 2002. *Tool-being: Heidegger and the metaphysics of objects*. Chicago and La Salle, IL: Open Court.

Harman, G., 2011. Realism without Materialism. *SubStance* 40, 52–72.

Harman, G., 2012. *The Well-Wrought Broken Hammer: Object-Oriented Literary Criticism*. *New Literary History* 43, 183–203.

Harman, G., 2014. Entanglement and relation: a response to Bruno Latour and Ian Hodder. *New Literary History* 45, 37–49.

Harris, O.J.T., 2014. (Re)assembling communities. *Journal of Archaeological Method and Theory* 21, 76–97.

Heidegger, M., 1962. *Being and time*. Oxford: Blackwell.

Hodder, I., 1999. *The archaeological process: an introduction*. Oxford: Blackwell.

Hodder, I., 2012. *Entangled: an archaeology of the relationships between humans and things*. Malden, MA: Wiley-Blackwell.

Hodder, I. and Mol, A., 2016. Network Analysis and Entanglement. *Journal of Archaeological Method and Theory* 23, 1066–1094.

Hodder, I., 2018. Big History and a post-truth archaeology. *The SAA Archaeological Record* 18(5), 43–45.

Ingold, T., 2007. Materials against materiality. *Archaeological Dialogues* 14, 1–16.

Knappett, C., 2007. Materials with materiality? *Archaeological Dialogues* 14, 20–23.

Knappett, C., 2011. *An archaeology of interaction: network perspectives on material culture and society*. Oxford: Oxford University Press.

Knappett, C., 2013. *Network analysis in archaeology: new approaches to regional interaction*. Oxford: Oxford University Press.

Latour, B., 1991. Technology is society made durable. *In:* J. Law, ed. *A Sociology of Monsters: Essays on Power, Technology, and Domination*. London and New York: Routledge, 103–131.

Latour, B., 1993. *We have never been modern*. New York: Harvester Wheatsheaf.

Latour, B., 1996. On actor-network theory: A few clarifications. *Soziale Welt* 47, 369–381.

Latour, B., 1999. *Pandora's hope: essays on the reality of science studies*. Cambridge: Harvard University Press.

Latour, B., 2005. *Reassembling the social: an introduction to actor-network-theory*. Oxford: Oxford University Press.

Latour, B., 2010. *On the modern cult of the factish gods*. Durham, NC: Duke University Press.

Meillassoux, Q., 2008. *After finitude: an essay on the necessity of contingency*. London: Continuum.

Merhav, R., 1991. *Urartu: a metalworking center in the first millennium B.C.E*. Jerusalem: Israel Museum.

Merleau-Ponty, M., 2014 [1945]. *Phenomenology of perception*. London: Routledge.

Morton, T., 2012. An Object-Oriented Defense of Poetry. *New Literary History* 43, 205–224.

Muscarella, O.W., 1978. Urartian Bells and Samos. *Journal of the Ancient Near Eastern Society* 10(1), 61–72.

Olsen, B., 2003. Material culture after text: re-membering things. *Norwegian Archeological Review* 36, 87–104.

Olsen, B., 2010. *In defense of things: archaeology and the ontology of objects*. Lanham, MD: Rowman & Littlefield Publishers.

Olsen, B., 2012. After interpretation: Remembering archaeology. *Current Swedish Archaeology* 20, 11–34.
Olsen, B., Shanks, M., Webmoor, T. and Witmore, C., 2012. *Archaeology: the discipline of things*. Berkeley, CA: University of California Press.
Peirce, C.S., 1958. *Collected Papers of Charles Sanders Peirce, vol. 8: Reviews, Correspondence, and Bibliography*. Cambridge: Harvard University Press.
Pétursdóttir, Þ., 2007. *"Deyr fé, deyja frændr": Re-animating mortuary remains from Viking Age Iceland*. Master's thesis. Tromsø: University of Tromsø.
Preucel, R.W., 2006. *Archaeological semiotics*. Malden: Blackwell
Quine, W.V.O., 1951. Two dogmas of empiricism. *The Philosophical Review* 60, 20–43.
Quino, 1986. *Le Club de Mafalda 10*. Grenoble: Glenat Editions.
Ribeiro, A., 2016. Against object agency. A counterreaction to Sørensen's 'Hammers and nails'. *Archaeological Dialogues* 23, 229–235.
Ribeiro, A., 2019, Archaeology and the New Metaphysical Dogmas: Comments on Ontologies and Reality. *Forum Kritische Archäologie* 8, 25–38.
Tilley, C., 2007. Materiality in materials. *Archaeological Dialogues* 14, 16–20.
Shanks, M., 2007. Symmetrical archaeology. *World Archaeology* 39, 589–596.
Shennan, S., 2007. Evolving ideas. *Cambridge Archaeological Journal* 17(2), 220–21.
Van Inwagen, P., 1987. When Are Objects Parts? *Philosophical perspectives* 1, 21–47.
Van Oyen, A., 2015. Actor-Network Theory's Take on Archaeological Types: Becoming, Material Agency and Historical Explanation. *Cambridge Archaeological Journal* 25, 63–78.
von Falkenhausen, L., 1993. *Suspended music: chime-bells in the culture of Bronze Age China*. Berkeley: University of California Press.
Watts, C.M., 2008. On Mediation and Material Agency in the Peircean Semeiotic. *In:* C. Knappett and L. Malafouris, eds. *Material Agency: Towards a Non-Anthropocentric Approach*. New York: Springer, 87–207.
Watts, C.M., 2013. *Relational archaeologies: humans, animals, things*. London: Routledge.
Webmoor, T., 2007. What about 'one more turn after the social' in archaeological reasoning? Taking things seriously. *World Archaeology* 39, 563–578.
Webmoor, T. and Witmore C.L., 2008. Things are us! A commentary on human/things relations under the banner of a 'social'archaeology. *Norwegian Archaeological Review* 41, 53–70.
Witmore, C.L., 2007. Symmetrical archaeology: excerpts of a manifesto. *World Archaeology* 39, 546–562.
Witmore, C.L., 2014. Archaeology and the new materialisms. *Journal of Contemporary Archaeology* 1, 203–246.
Wittgenstein, L., 2009 [1953]. *Philosophical investigations*. Chichester: Wiley-Blackwell.

CHAPTER 2

The Organisation of Societies

Figure chapter 2: Maidanetske, Ukraine. Reconstruction of the Trypillia mega-site (detail): residential houses, gardens and fenced-in areas for intensive livestock farming are grouped along the circumferential 'ring corridor', the central traffic axis of the settlement and communal buildings ('mega-structures') are located within this area. The settlement is surrounded by a causewayed enclosure interrupted by numerous earth bridges (Drawing: Susanne Beyer; graphic: Petra Horstmann).

Mt. Chikiani Obsidian and Its Ritual Use on the Javakheti Plateau?
(Georgian Caucasus)

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KEYWORDS: *Georgian Caucasus, Javakheti Plateau, Mt. Chikiani obsidian, surveys, kurgans, rituals*

Abstract

The scope of this paper is to describe and discuss two kurgans discovered on the terraces of Mt. Shaori and close to the village of Kavta, near Trialeti, whose surfaces were covered with obsidian artefacts. As far as we know, these are unique cases in the Bronze Age archaeology of Georgia. What do we really know of the use of obsidian in this region of the Caucasus despite the recent discovery of obsidian mining fields along the slopes of Mt. Chikiani, and the results of nine years of archaeological surveys and obsidian characterisations that have greatly improved our knowledge? The general impression is that obsidian has too often been neglected by archaeologists despite its economic importance. Was it used only for the manufacture of specific types of functional and ritual tools or did it play different roles of which we indeed still know too little?

Zusammenfassung

In diesem Beitrag werden zwei Kurgane beschrieben und diskutiert, die auf den Terrassen des Berges Shaori und in der Nähe des Dorfes Kavta in der Nähe von Trialeti entdeckt wurden und deren Oberflächen mit Obsidianartefakten bedeckt waren. Soweit wir wissen, handelt es sich dabei um einzigartige Fälle in der bronzezeitlichen Archäologie Georgiens. Was wissen wir wirklich über die Verwendung von Obsidian in dieser Region des Kaukasus, trotz der kürzlichen Entdeckung von Obsidianabbaugebieten an den Hängen des Berges Chikiani und der Ergebnisse von neun Jahren archäologischer Untersuchungen und Obsidiancharakterisierungen, die unser Wissen erheblich verbessert haben? Der allgemeine Eindruck ist, dass Obsidian von den Archäologen trotz seiner wirtschaftlichen Bedeutung zu oft vernachlässigt wurde. Wurde er nur für die Herstellung bestimmter funktioneller und ritueller Werkzeuge verwendet oder spielte er auch andere Rollen, über die wir noch zu wenig wissen?

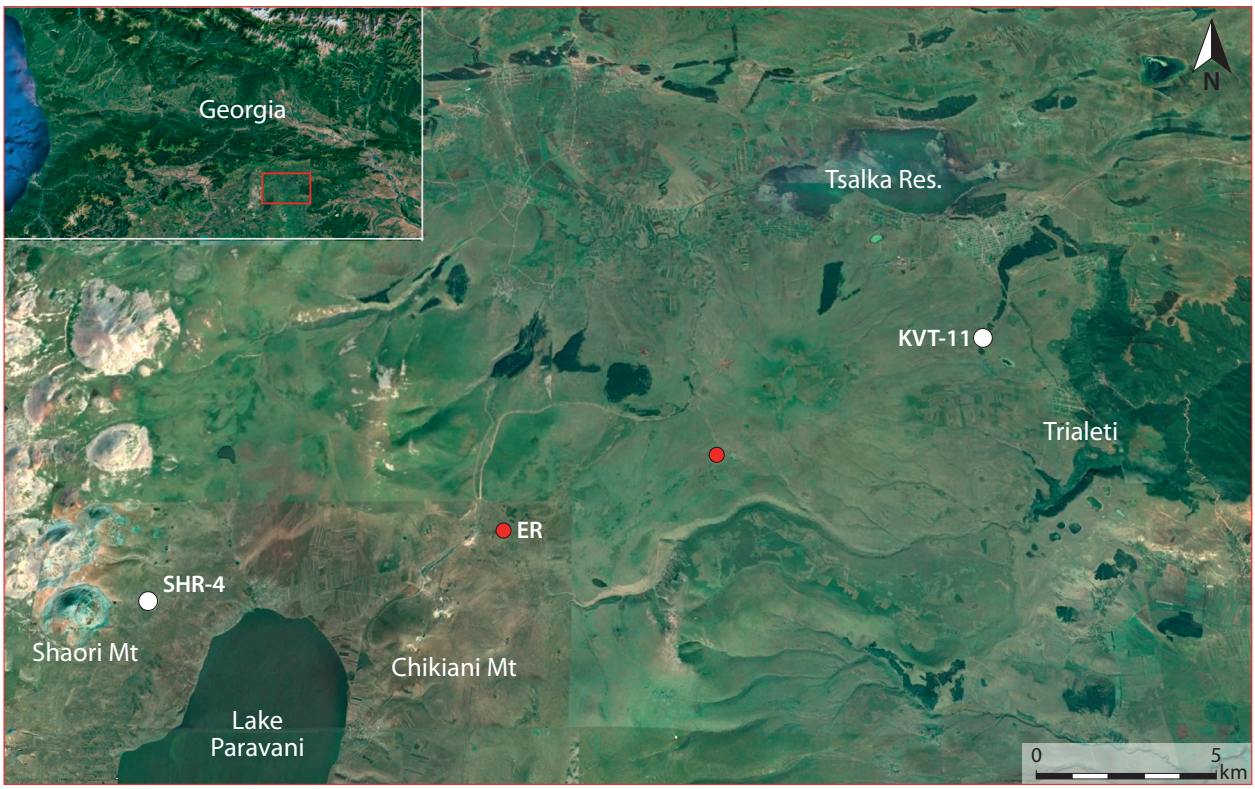

Fig. 1. Location of the two kurgans described in this paper (KVT-11 and SHR-4) in the Javakheti Plateau. The two red dots show the location of the most important obsidian workshops so far discovered in the area.

INTRODUCTION

The discovery of obsidian mining fields and the identification of new groups of Mt. Chikiani obsidian have promoted new fieldwork on the Javakheti Plateau (Biagi and Nisbet 2018). The scope of the new surveys has been to investigate a wider territory, find new sites and collect obsidian samples for LA-ICP-MS characterisation to interpret the routes of obsidian circulation in the region and the ways it was transported from the mining fields and workshops to different localities (Biagi and Gratuze 2016). This is why, during the last three years, fieldwork has been extended to the western slopes of Mt. Paravani, the volcanic area around Mt. Shaori, west of Lake Paravani, and other zones of the Javakheti Plateau which gently slope towards the villages of Trialeti and Kavta (Fig. 1). The characteristics of the geology of this region is well known from decades (Lebedev *et al.* 2008). All the surveyed territory is incised by river courses, punctuated by small lakes, some of which have yielded traces of prehistoric settling, which is shown by the recovery of knapped obsidian artefacts along their shores.

Surveys in the region have been conducted by two to four people, two weeks a year, between July and August 2014–2023. Each site or artefact has been located by Garmin GPS coordinates, labelled, and photographed from different altitudes with a non-professional 'dji Mini2' drone. The presence of some archaeological sites, which had been noticed on Google Earth and professional Black and White satellite images Worldview01, has been checked during fieldwork. All together the investigated area has been extended to an area of *c.* 300 km^2. Dozens of new sites and isolated artefacts have been recorded, among which are kurgans, stone-walled villages, megalithic alignments, pits and quarries dug into the bedrock to extract basalt/andesite blocks and schist slabs, and workshops for the manufacture of specific types of obsidian artefacts (Biagi 2023).

The territory around Mt. Chikiani is famous for its archaeological discoveries. Though rescue excavations in the area have been conducted also a few years ago (Narimanishvili 2010; Shanshashvili 2010), most sites and *kurgans* were excavated between 1936 and 1940 thanks to a huge rescue operation promoted and financed by the Committee for the Preservation of Cultural Monuments of the Board of Art of the Georgian Socialist Republic, and were published in a seminal volume a year later (Kuftin 1941).

It is well known that two important Bronze Age Cultures of the Caucasus, Trialeti and Bedeni (Rubinson 1977; Bertram 2010), have been defined thanks to the discoveries made in those years. Moreover, Mt. Chikiani (otherwise called Koyun Dağ) has always been known because of the rich obsidian sources (Chataigner and Gratuze 2014). However, the discovery of groups of obsidian mining pits along the lower slopes of the volcano has been made only a few years ago (Biagi *et al.* 2017a).

Mt. Chikiani (2417 m a.s.l.) rises at the north-eastern edge of Lake Paravani (2073 m a.s.l.), the largest basin in Georgia. The lake is only 2.2–3.3 m deep, and extends over a surface of ca 37.5 km^2 (Messager *et al.* 2013). Its northern edge is covered with monumental kurgans (Kvavadze and Kakhiani 2010). The pollen cores extracted from Lake Paravani deposits have contributed to the interpretation of the vegetation changes and tree-line oscillations that took place in the region during the last 12,000 years (Messager *et al.* 2021).

As far as we know, the case of the Javakheti Plateau monumental landscape is unique in south-eastern Europe. The general impression is that some of its territories were selected to conduct specific activities due to their location, orientation, natural resources and rock texture. The construction of complex structures, among which are impressive stone-walled villages, stone alignments and kurgans, shows that social transformation was ongoing around the beginning of the 2nd millennium BCE (Furholt 2021) when ore mining and metallurgy began to be practised. We know that social order changed when important economic activities developed and rapidly improved (Stöllner 2016). Apart from the impressed stone structures reported above, in this part of the Caucasus the most evident changes are stressed by obsidian mining, tools manufacture and trade, among which are everyday use of metal artefacts and weapons, and gold mining for the production of jewellery and luxury items (Stöllner 2012). The importance of obsidian mining and circulation has been widely discussed (Badalyan 2010; Erb-Satullo *et al.* 2023) because obsidian "*is a vital production material. Once possessed it is regarded as a necessity*" (Jacobs 1970, 23).

MATERIALS AND METHODS

The surveys carried out in 2021 around the village of Kavta and the small lakes close to it, led to the discovery of several obsidian findspots and a few kurgans. Regarding the latter, an important discovery was made on the top of a hillock facing the gentle slopes that take down to Trialeti. The kurgan, labelled KVT-11 (see Table 1), is located at 1602 m a.s.l. north of a small lake (Fig. 2). On the surface of the structure, *c.* 16 m in diameter, 263 black obsidian artefacts were collected in three seasons (2021–2023), five of which were characterised as coming from three different Mt. Chikiani sources (one obsidian piece from source 1, two from source 2a, and two from source 2b; Gratuze pers. comm. 2023). The obsidian artefacts consist mainly of flakes, flakelets and small blocks. One round-based fragment of an almond-shaped bifacial arrowhead was also collected as well as a broken bladelet with sickle gloss. The arrowhead can be referred to type III/1 of Orjonikidze's typological classification (Orjonikidze 2004, 35), which the author attributes to the Late Neolithic (see Fig. 4, top). These types are quite unusual in western Georgia, though they are common in the eastern regions of the country.

Table 1. Most important characteristics of the kurgans KVT-11 and SHR-4, and of the obsidian artefacts recovered from their surface. The distance is approximate from the Mt. Chikiani obsidian mining area.

Site name	Coordinates	m a.s.l.	Distance	Weight (gr)	Artefacts	Black	Red/spotted	Corticated	Complete	Broken	Small blocks
KVT-11	41°33'37.6"N–44°04'50.7"E	1602 m	19.0 km NE	882	263	263	0	19 (7.22 %)	44 (16.73 %)	214	5
SHR-4	41°29'06.6"N–43°46'21.7"E	2299 m	8.5 km W	380	68	64	4	12 (17.64 %)	15 (22.05 %)	45	8

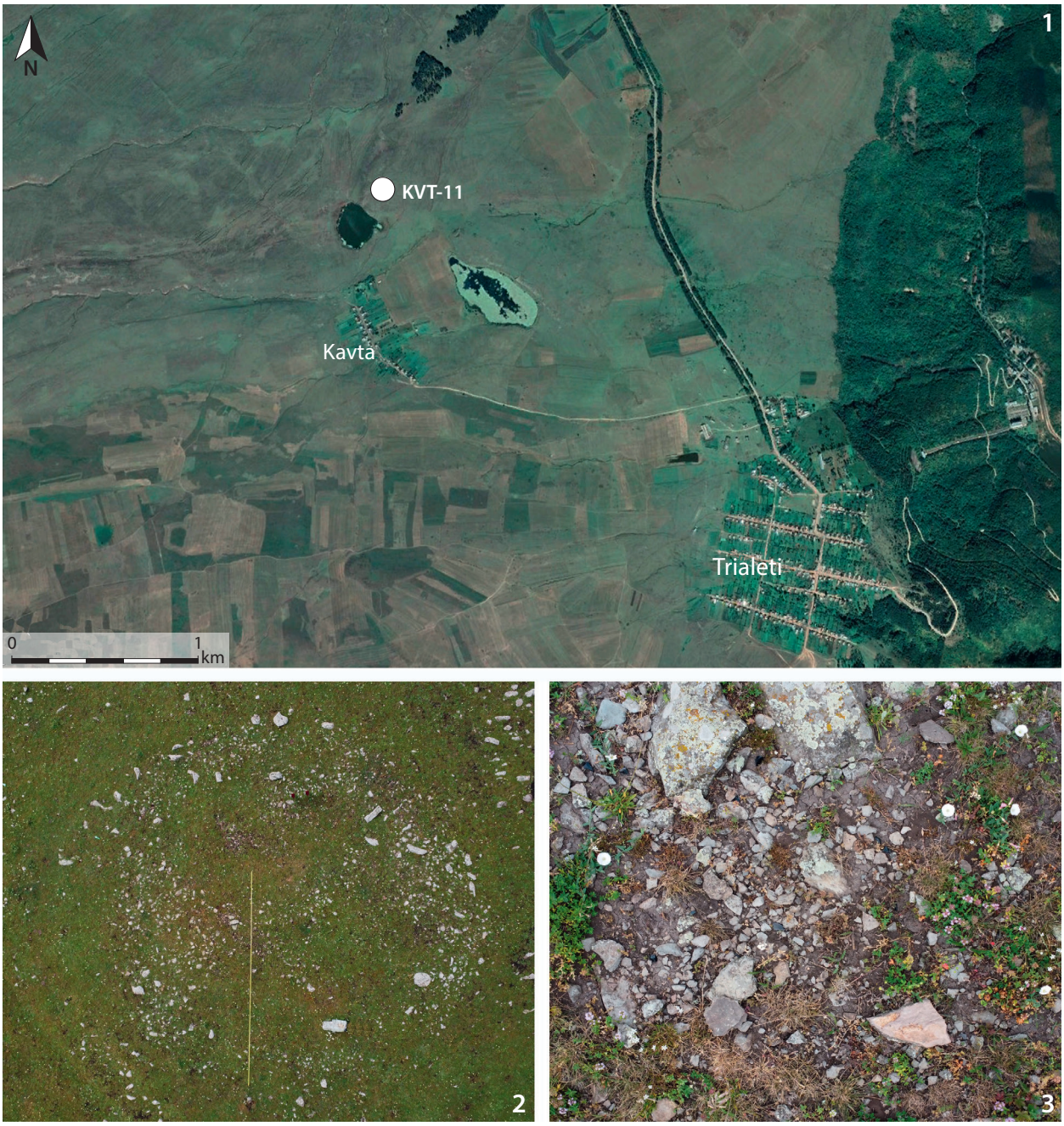

*Fig. 2. Kurgan KVT-11: **1** Location of the funerary structure north of the village of Kavta; **2** the kurgan from the air; **3** its surface covered with obsidian artefacts (Drone photos in 2022: Marco Ferrandi).*

During the summer of 2023, surveys were extended to the volcanic landscape north-west of the Lake Paravani, more precisely to the terraces around Mt. Shaori, on the top of which the Bronze Age fortress is built (Licheli *et al.* 2022). Some of the terraces showed the presence of many kurgans and impressive stone-walled megalithic villages. The surveyed area yielded just a few obsidian artefacts.

However, the surface of a kurgan, some 15 m in diameter, located at 2299 m a.s.l. (Fig. 3, Table 1), yielded 68 artefacts, mainly fragments, though also a few small blocks, obtained mostly from black obsidian. The percentage of complete, unretouched artefacts retrieved from the surface of the two kurgans is rather similar.

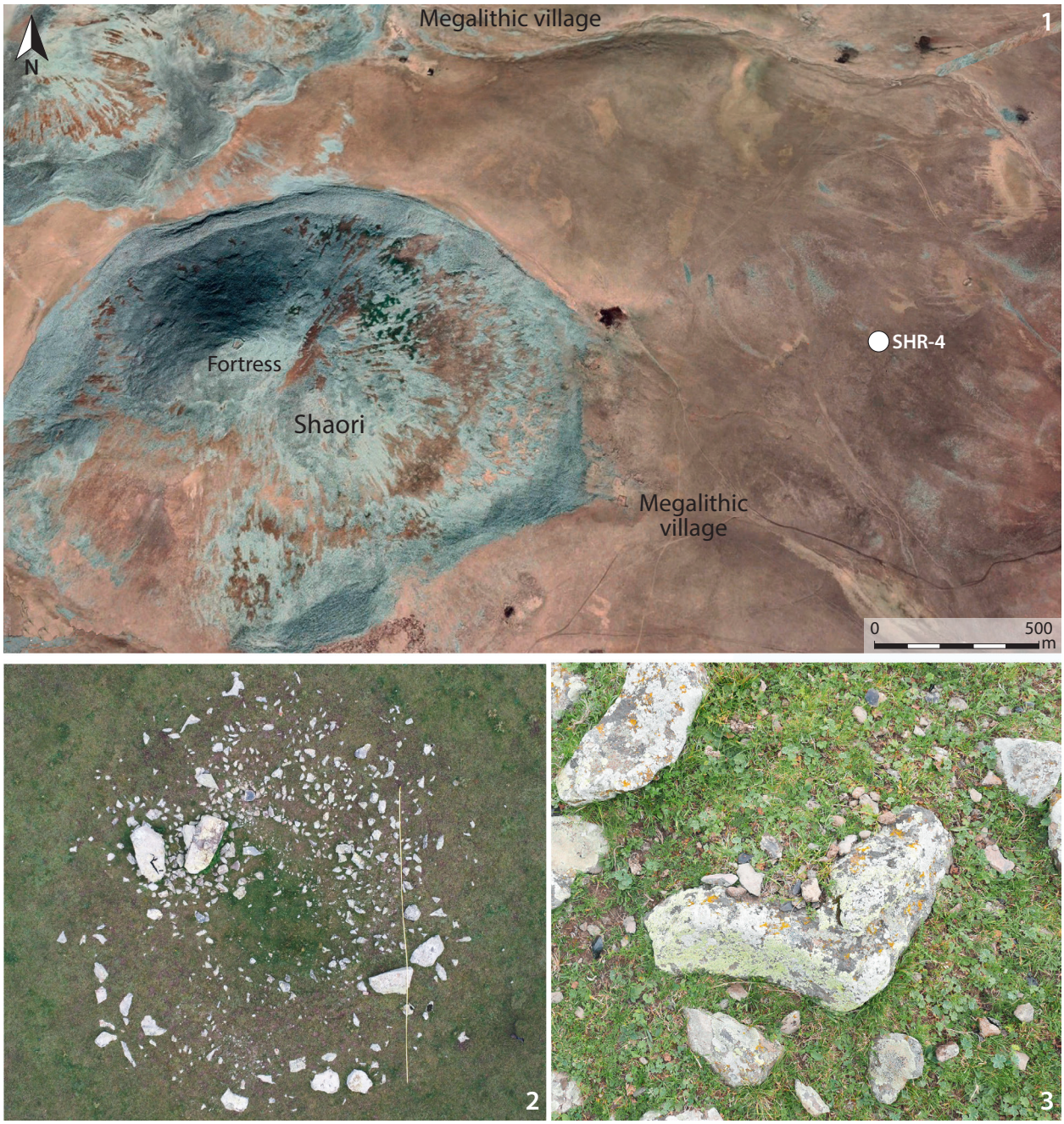

*Fig. 3. Kurgan SHR-4: **1** Location of the funerary structure east of Mt. Shaori; **2** the kurgan from the air, **3** its surface covered with obsidian artefacts (Drone photos in 2023: Marco Ferrandi).*

The two assemblages consist mainly of fragmented pieces (Table 1). The dimensional diagrams developed measuring the complete, unretouched artefacts, have yielded comparable results (Fig. 5). However, they are different from those obtained from the important ER obsidian workshop located ca 2.5 km north-east of Mt. Chikiani (Fig. 1; Biagi *et al.* in press). The artefacts from the two kurgans appear to have been detached and fragmented voluntarily by very hard hammering, a procedure that has never been observed elsewhere in the area of the plateau so far investigated. At present, SHR-4 is the only funerary structure discovered in the surrounding of Mt. Shaori to have yielded obsidian artefacts.

Fig. 4. Obsidian artefacts recovered from the surface of kurgan KVT-11: 1 fragment of a round-based arrowhead; 2 obsidian artefacts from the surface of kurgan SHR-4 (Photos: Elisabetta Starnini and Paolo Biagi).

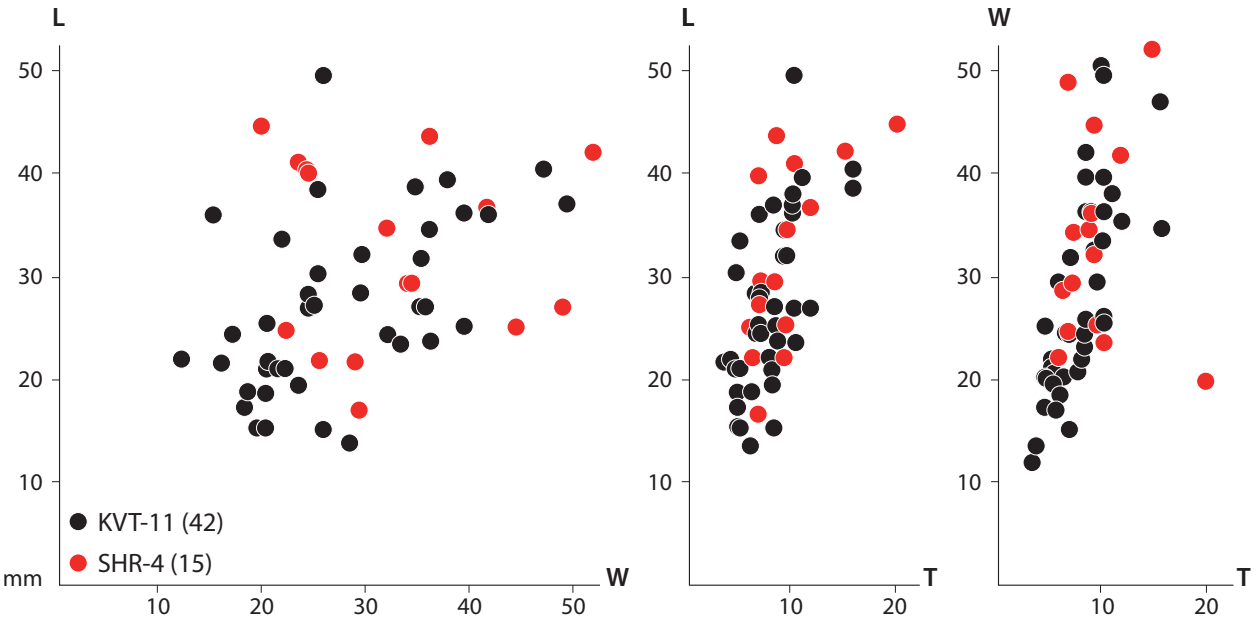

Fig. 5. Length/width, length/thickness, and width/thickness diagrams of the obsidian artefacts retrieved from the surface of kurgans KVT-11 and SHR-4.

DISCUSSION

Despite the presence of a very important obsidian source and the recovery of knapped stone tools from kurgan chambers and archaeological sites (Murvanidze 2016; Anderson *et al.* 2018), the study of lithic assemblages has largely been neglected in Georgia (Kushnareva 1997; Kohl 2007), apart from a few exceptions regarding specific types of artefacts (Orjonikidze 2004).

The surveys carried out during the last decade around Mt. Chikiani and part of the Javakheti highland have yielded important results which help interpret the building of a monumental landscape (Hinz *et al.* 2019) characterised by stone-walled villages, fortresses, different types of kurgans sometimes interconnected by long stone causeways, megalithic alignments, menhirs,

and extended mining fields, marked by groups of mining pits opened to exploit the rich obsidian flows of Mt. Chikiani (Kuftin and Field 1946; Biagi *et al.* 2017a). It has been suggested that this monumental landscape started to be built around the beginning of the metal ages, when the important Mt. Chikiani obsidian sources began to be mined and the material to be traded throughout most of the Caucasus (Badalyan 2010) following modes we are currently investigating. However, many questions are still waiting for an answer. For example, why was obsidian mined during the Bronze Age while it was simply collected from the surface in the preceding periods that is from the end of the Middle Palaeolithic onwards (Biagi 2024)? Did the Bronze Age artisans need unweathered material for better quality tool manufacture (Purdy 1984)?

The obsidian artefacts collected from the surface of kurgans KVT-11 and SHR-4 were undoubtedly carried to the sites and then spread all over the funerary structures for some specific reasons that we do not currently know. The distance between the two kurgans from the Chikiani mining fields is a few hours' walk (see Table 1) throughout a mountain landscape and most probably a difficult terrain (Wilson 2007), across which traces of Bronze Age roads have not yet been detected (Narimanishvili *et al.* 2019). Moreover, we know that small, hard hammered, almost crashed obsidian pieces, do not occur either from the surface of the eastern slopes of Mt. Chikiani (Biagi *et al.* 2017b), where the obsidian mines were dug out, or from the most important obsidian workshops so far discovered in the area. For sure these artefacts do not fit into the lithic production system of the ER workshop (Ericson 1984), which was directed toward the manufacture of bifacial arrowheads and spearheads, though a few bladelet artefacts have also been collected (Biagi and Nisbet 2023).

Does the recovery of obsidian fragments from the surface of mortuary structures (kurgans), open new questions regarding the role played by lithic material in some of the metal age rituals practised in the Caucasus? We know a few cases of "necrolithisation" in the Aegean Bronze Age (Carter 2007), which however cannot be compared with those that eventually took place in the Javakheti Plateau. The same can be said of some historic Central American cases, where the use of obsidian for rituals is well documented (Stemp and Awe 2014; Morton *et al.* 2019) and its symbolic meaning (Earle 1982) plays an important role especially as regards its "*celestial origin*", a concept that is deeply rooted also in the European tradition (Pastrana and Athie 2021).

CONCLUSION

The discovery of the two kurgans reported above contributes to the study of the complexity of the monumental landscape built in the territory that surrounds Mt. Chikiani, one of the most important obsidian sources of the Caucasus. Following the results obtained from the surveys carried out during the last decade, we can start to interpret the role played by obsidian in the economy of the Bronze Age societies that seasonally settled in the area, of which we still know very little. However, apart from its economic importance, we can suggest that obsidian was used also for other non-functional activities. In this respect we have first to stress the great variability of kurgan types built in the plateau, which undoubtedly hide a great number of information that actually we are not capable to develop.

Moreover, we have noticed that detached obsidian flakes recur in many places of the surveyed Javakheti Plateau, as single specimens or small concentrations. They have been retrieved not only from the top of kurgans, but also within some of the stone-walled villages and other megalithic features and the open landscape from which no evident archaeological feature has been recorded. This is an important element which shows that the entire plateau was exploited, for reasons that we do not precisely know, although for sure also for hunting purposes, which are suggested by the recovery of isolated specimens of bifacial obsidian arrowheads.

What is the meaning of all these data? and what is the meaning of the scatters of obsidian fragments retrieved from kurgans KVT-11 and SHR-4? It has been observed that objects

> "*may be widely exchanged within a particular context, because its associated symbolism is appropriate for certain ideological functions.*" (Hodder 1982a)

Did the two kurgans play a special role in the social structure of the Bronze Age Caucasus? Do the obsidian hard-hammered fragments covering their surface have a symbolic meaning regarding the role of the deceased, or some kind of regional pattern (Hodder 1982b)? All these problems should be approached in the future following broader territorial perspectives. We are aware that research on individual sites can only make a small contribution to the study of territorial exploitation (Torrence 1986).

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REFERENCES

Anderson, W. and Cleary, M.N., 2018. Prehistory from the Ploughsoil: Interpreting Artefact Distributions from Intensive Survey in the Highlands of Samtskhe-Javakheti, Southern Georgia. *In*: W. Anderson, K. Hopper and A. Robinson, eds. *Landscape Archaeology in Southern Caucasia. Finding Common Ground in Diverse Environments*. Oriental and European Archaeology 8, 83–96.

Badalyan, R.S., 2010. Obsidian in the Southern Caucasus: The Use of Raw Materials in the Neolithic to the Early Iron Ages. *In: Hansen et al. 2010*, 28–38.

Bertram, J.-K., 2010. Zum Martqopi-Bedeni-Horizont im Südkaukasusgebiet. *In: Hansen et al. 2010*, 253–261.

Biagi, P., 2024. Building the Lesser Caucasus monumental landscape during the Bronze Age: Life and Death in the Javakheti Plateau. *Ancient Civilizations from Scythia to Siberia* 30, 64–90. https://doi.org/10.1163/15700577-20232916

Biagi, P. and Gratuze, B., 2016. New Data on Source Characterization and Exploitation of Obsidian from the Chikiani Area (Georgia). *In*: A. Ferrari and E. Ianiro, eds. *Armenia, Caucaso e Asia Centrale. Ricerche 2016*. Eurasiatica 6, 9–29. https://doi.org/10.14277/6969-093-8/EUR-6-1

Biagi, P. and Nisbet, R., 2018. The Georgian Caucasus and its resources: The exploitation of Mount Chikiani uplands during the metal ages. *Antiquity* 92(362), 1–9. https://doi.org/10.15184/aqy.2018.53

Biagi, P. and Nisbet, R., 2023. Mining knappable stone resources during the Bronze Age: Some examples from the Caucasus (Georgia) and Sindh (Pakistan). *In*: L. Dergacheva, ed. *Aere Perennius. More Lasting than Bronze. Essays in honour of Valentin Dergachev on the occasion of his 80th birthday*. Kishinev: Bibliotheca Stratum, 413–431.

Biagi, P., Nisbet, R. and Gratuze, B., 2017a. Discovery of obsidian mines on Mount Chikiani in the Lesser Caucasus of Georgia. *Antiquity* 91(357), 1–8. https://doi.org/10.15184/aqy.2017.39

Biagi, P., Nisbet, R. and Gratuze, B., 2017b. Obsidian mines and their characterization: New aspects of the exploitation of the obsidian sources of Mt. Chikiani (Koyun Dağ) in the Lesser Caucasus of Georgia. *The Quarry* 12, 2–24.

Biagi, P., Nisbet, R. and Gratuze, B., in press. Highland zone exploitation in South-eastern Europe: the case of Mount Chikiani obsidian in the Javakheti Plateau (Georgia). *In*: F.-X. Le Bourdonnec, S. Shackley and M. Orange, eds. *Sourcing Obsidian*. Berlin: Springer Nature.

Carter, T., 2007. The Theatrics of Technology: Consuming Obsidian in the Early Cycladic Burial Arena. *Archaeological Papers of the American Anthropological Association* 17(1), 88–107. https://doi.org/10.1525/ap3a.2007.17.1.88

Chataigner, C. and Gratuze, B., 2014. New Data on the Exploitation of Obsidian in the Southern Caucasus (Armenia, Georgia) and Eastern Turkey. Part 1: Source Characterization. *Archaeometry* 56(1), 25–47. https://doi.org/10.1111/arcm.12006

Earle, T.K., 1982. Prehistoric Economics and the Archaeology of Exchange. *In*: *Ericson and Earle 1982*, 1–12.

Erb-Satullo, N.L., Rutter, M., Frahm, E., Jachvliani, D., Albert, P.G. and Smith, V.C., 2023. Obsidian exchange networks and highland-lowland interaction in the Lesser Caucasus borderlands. *Journal of Archaeological Science: Reports* 49, 103998. https://doi.org/10.1016/j.jasrep.2023.103998

Ericson, J.E., 1984. Toward the analysis of lithic production systems. *In*: J.E. Ericson and B.A. Purdy, eds. *Prehistoric quarries and lithic production. New Directions in Archaeology*. Cambridge: Cambridge University Press, 1–9.

Ericson, J.E. and Earle, T.K., eds., 1982. *Contexts of Prehistoric Exchange*. New York: Academic Press.

Furholt, M., 2021. Mobility and Social Change: Understanding the European Neolithic Period after the Archaeogenetic Revolution. *Journal of Archaeological Research* 29, 481–535. https://doi.org/10.1007/s10814-020-09153-x

Gamkrelidze 2010: Gamkrelidze G., ed. *Rescue Archaeology in Georgia: The Baku-Tbilisi-Ceyhan and South Caucasian pipeline*. Tbilisi: Georgian National Museum.

Hansen, S., Hauptmann, A., Motzenbäcker, I. and Pernicka, E., eds., 2010. *Von Majkop bis Trialeti. Gewinnung und Verbreitung von Metallen und Obsidian in Kaukasien im 4.–2. Jt. v. Chr.*, Kolloquien zur Vor-und Frühgeschichte 13. Bonn: Habelt.

Hinz, M., Müller, J. and Wunderlich, M., 2019. The monumentalisation of European landscapes. *In*: M. Hinz, J. Müller and M. Wunderlich, eds. *Megaliths Societies Landscapes. Early Monumentality and Social Differentiation in Neolithic Europe*, Frühe Monumentalität und soziale Differenzierung 18(1) Bonn: Habelt, 21–23.

Hodder, I., 1982a. Toward a Contextual Approach to Prehistoric Exchange. *In*: *Ericson and Earle 1982*, 199–211.

Hodder, I., 1982b. *Symbols in action. Ethnoarchaeological studies of material culture*. Cambridge: Cambridge University Press.

Jacobs, J., 1970. *The Economy of Cities*. New York: Vintage Books.

Kohl, P.L., 2007. *The Making of Bronze Age Eurasia*. Cambridge: Cambridge University Press.

Kuftin, B.A., 1941. *Archaeological Excavations in Trialeti I. An Attempt to periodize the Archaeological Material*. Tbilisi: Georgian Academy of Sciences (in Georgian and Russian).

Kuftin, B.A. and Field, H., 1946. Prehistoric Culture Sequence in Transcaucasia. *Southwestern Journal of Anthropology*, Autumn 1946 2(3), 340–360.

Kushnareva, K.K., 1997. *The Southern Caucasus in Prehistory. Stages of Cultural and Socioeconomic Development from the Eight to the Second Millennium BC*, University Museum Monograph 99. Philadelphia: The University Museum.

Kvavadze, E. and Kakhiani, K., 2010. Palynology of the Paravani burial mound (Early Bronze Age, Georgia). *Vegetational History and Archaeobotany* 19, 469–478. https://doi.org/10.1007/s00334-010-0259-x

Lebedev, V.A., Bubnov, S.N., Dudauri, O.Z. and Vashakidze, G.T., 2008. Geochronology of Pliocene Volcanism in the Dzhavakheti Highland (the Lesser Caucasus). Part 2: Eastern Part of the Dzhavakheti Highland. Regional Geological Correlation. *Stratigraphy and Geological Correlation* 16, 553–574.

Levine, M.N. and Carballo, D.M., eds., 2014. *Obsidian Reflections: Symbolic Dimensions of Obsidian in Mesoamerica*. Denver: University Press of Colorado

Licheli, V., Dan, R., Vitolo, P., Chogovadze, T. and Cesaretti, A., 2022. Cyclopean Fortresses, Royal Cities or Mountain Shelters? The Abuli and Shaori Complexes in Southern Georgia in the Light of Recent Archaeological Investigations. *Ancient Civilizations from Scythia to Siberia* 28, 148–176. https://doi.org/10.1163/15700577-20221402

Messager, E., Belmecheri, S., Von Grafenstein, U., Nomade, S., Ollivier, V., Voinchet, P., Puaud, S., Courtin-Nomade, A., Guillou, H., Mgeladze, A., Dumoulin, J.-P., Mazuy, A. and Lordkipanidze, D., 2013. Late Quaternary record of the vegetation and catchment-related changes from Lake Paravani (Javakheti, South Caucasus). *Quaternary Science Reviews* 77, 125–140. https://doi.org/10.1016/j.quascirev.2013.07.011

Messager, E., Poulenard, J., Sabatier, P., Develle, A.-L., Wilhelm, B., Nomade, S., Scao, V., Giguet-Covex, C., Von Grafenstein, U., Arnaud, F., Malet, E., Mgeladze, A., Herrscher, E., Banjan, M., Mazuy, A., Dumoulin, J.-P., Belmecheri, S. and Lordkipanidze, D., 2021. Paravani, a puzzling lake in the South Caucasus. *Quaternary International* 579, 6–18. https://doi.org/10.1016/j.quaint.2020.04.005

Morton, S.G., Awe, J.J. and Pendergast, D.M., 2019. Shattered: Object fragmentation and social enchainment in the eastern Maya lowlands. *Journal of Anthropological Archaeology* 56, 101–108. https://doi.org/10.1016/j.jaa.2019.101108

Murvanidze, B., 2016. Catalogue. *In*: Z. Makharadze, N. Kalandadze and B. Murvanidze, eds. *Ananauri Big Kurgan n° 3*. Tbilisi: Georgian National Museum, 312–368.

Narimanishvili, G., 2010. Trialeti in the 15th and 14th centuries BC. *In*: *Gamkrelidze 2010*, 312–369.

Narimanishvili, G., Shanshashvili, N. and Narimanishvili, D., 2019. Kurgans of Trialeti: The Roads to Eternity. *In*: N. Lanieri, G. Palumbi and S. Müller Celka, eds. *Constructing Kurgans. Burial Mounds and Funerary Customs in the Caucasus and Eastern Anatolia During the Bronze and Iron Age*, SANEM 4. Roma: Arbor Sapientiae, 82–90.

Orjonikidze, A., 2004. Types of stone arrowheads from Georgia. *Dziebani* 13–14, 36–61.

Pastrana, A. and Athie, I., 2021. The The Symbolism of Obsidian in Postclassic Central Mexico. *In: Levine and Carballo 2014*, 75–110. https://doi.org/10.5876_9781607323013.c003

Purdy, B.A., 1984. Quarry studies: technological and chronological significance. *In*: J.E. Ericson and B.A. Purdy, eds. *Prehistoric quarries and lithic production*. Cambridge: Cambridge University Press, 119–125.

Rubinson, K., 1977. The Chronology of the Middle Bronze Age at Trialeti. *Bibliotheca Mesopotamica* 7, 235–248.

Shanshashvili, N., 2010. Sites of the Kura-Araxes Culture in Trialeti. *In*: *Gamkrelidze 2010*, 161–193.

Stemp, W.J. and Awe, J., 2014. Ritual Use of Obsidian in Naya Caves in Belize. A Functional and Symbolic Analysis. *In: Levine and Carballo 2014*, 223–254. https://doi.org/10.5876/9781607323013.c008

Stöllner, T., 2012. Mining and Elites: A Paradigm Beyond the Evidence in European Metal Ages. *In*: T.L. Kienlin and A. Zimmermann, eds. *Beyond Elites. Alternatives to Hierarchical Systems in Modelling Social Formations*, Universitätsforschungen zur prähistorischen Archäologie 215. Bonn: Habelt, 433–448.

Stöllner, T., 2016. The Beginnings of Social Inequality: Consumer and Producer Perspectives from Transcaucasia in the 4th and the 3rd Millennia BC. *In*: M. Bartelheim, B. Horejs and R. Krauß, eds. *Von Baden bis Troia. Ressourcennutzung, Metallurgie und Wissenstransfer,* Oriental and European Archaeology 3. Rahden/Westfalen: Verlag Marie Leidorf, 209–234.

Torrence, R., 1986. *Production and exchange of stone tools*. Cambridge: Cambridge University Press.

Wilson, L., 2007. Understanding Prehistoric Lithic Raw Material Selection: Application of a Gravity Model. *Journal of Archaeological Method and Theory*, 14(4), 388–411. https://doi.org/10.1007/s10816-007-9042-4

How Settlement Data Can Counterbalance Male Warrior Elite Narratives of the Bronze Age – Thoughts and Suggestions for Future Research

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KEYWORDS: *settlement, gender roles, farming life*

Abstract

Northwest European Late Neolithic and Bronze Age societies are supposedly ruled by powerful elites who dominated critical resources and knowledge. The role of women in these societies and gender roles in general are hardly debated. I argue that this image of Late Neolithic and Bronze Age societies is distorted because the evidence for male elites is mainly based on burial evidence. In particular, from the moment onwards when weapons are presented as grave gifts to the ancestors, a neo-evolutionary interpretation of the grave goods strongly overrepresents men and their roles in society.

Moreover, if one studies settlement remains from the periods in question, hardly any evidence can be found for these male elites. Rather, when critically analysing essential tasks in farming communities, it becomes clear that female tasks must have been just as important as male tasks. Therefore, I argue that we have to place a greater focus on settlement data and apply a more holistic approach to farming life in order to create a more balanced and diverse view of gender roles in Late Neolithic and Bronze Age societies.

Zusammenfassung

Die Gesellschaften des Spätneolithikums und der Bronzezeit in Nordwesteuropa werden angeblich von mächtigen Eliten beherrscht, die essentielle Ressourcen und Wissen dominierten. Die Rolle der Frauen in diesen Gesellschaften und die Geschlechterrollen im Allgemeinen werden kaum diskutiert. Ich behaupte, dass dieses Bild der Gesellschaften des Spätneolithikums und der Bronzezeit verzerrt ist, da die Belege für männliche Eliten hauptsächlich auf Bestattungsnachweisen beruhen: insbesondere ab dem Zeitpunkt, an dem Waffen als Grabbeigaben an die Vorfahren überreicht werden, werden Männer und ihre Rolle in der Gesellschaft in einer neoevolutionären Interpretation der Grabbeigaben stark überrepräsentiert.

Andererseits lassen sich bei der Untersuchung von Siedlungsresten aus diesen Zeiträumen kaum Belege für diese männlichen Eliten finden. Vielmehr wird bei einer kritischen Analyse wesentlicher Aufgaben in Bauerngemeinschaften klar, dass weibliche Aufgaben genauso wichtig gewesen sein müssen wie männliche Aufgaben. Daher argumentiere ich, dass wir uns stärker auf Siedlungsdaten konzentrieren und einen ganzheitlicheren Ansatz für das Leben auf einem Gehöft verfolgen müssen, um ein ausgewogeneres und vielfältigeres Bild der Geschlechterrollen in den Gesellschaften des Spätneolithikums und der Bronzezeit zu schaffen.

INTRODUCTION

If you mostly work on settlement Late Neolithic and Bronze Age data, it is exceedingly difficult to fit them in the warrior elite narratives that are so mainstream nowadays that hardly anyone questions them anymore. Northwest European Late Neolithic and Bronze Age societies are supposed to have been ruled by powerful elites who even were able to raise standing armies. Their main goal seems to have been to fight and concur

their enemies in search for control over scarce resources like copper, gold, tin and amber (*e.g.* Meller 2017; Bertemes *et al.* 2010). Such basically Neo-Marxist theories dominate the archaeological world since the 1970s, virtually without fundamental critique (but see Graeber and Wengrow 2021). The archaeological world seems to agree that from (at least) the Late Neolithic onwards political economies were the driving force behind everything, implicitly dividing the world into have's and have-not's, in elites and commoners, chiefs and subordinates (*e.g.* Earle 2002; 2007; Kristiansen and Larsson 2005; Kristiansen 1987; 1991). The political economy model has caused archaeologists to focus on the access to critical resources like objects, materials and knowledge (*e.g.* Kristiansen and Larsson 2005, chapter 1). As these are easier to 'read' from burial data, the latter has become the major source of research. Even more so since isotope and aDNA analyses of skeletal material provide us with an entirely new generation of data (cf. Kristiansen 2021).

Although there are attempts to counterbalance this "top-down" approach from a theoretical perspective (*e.g.* Erickson 2006; Furholt *et al.* 2020), there are few practical examples of alternative approaches. In this article I will try to use settlement data to get a more nuanced and hopefully more balanced image of the past. I will argue that a consideration of settlement evidence not only leads to a more balanced view of hierarchy and social organisation, but also makes a less skewed gender perspective possible. I base my analysis on 40 years of settlement research, excavating and studying Late Neolithic, Bronze Age, Iron Age and Roman Period settlements in the Netherlands (*e.g.* Fokkens 1998b; 1996; Arnoldussen and Fokkens 2008; Fokkens *et al.* 2019).

THE NATURE OF SETTLEMENT DATA IN THE NETHERLANDS

Because objects and monuments are involved, burial data present a directly interpretable image of the past. In contrast, settlement data are often circumstantial: one must look at the data from different angles, and one has to be inventive to actually make the data speak. Typically, we encounter ditches, remains of farms and houses, with pottery as the main find category. Whereas underneath burial mounds the original surface is often preserved and can be sampled, in settlement research the original surface has disappeared. In the eastern, central, and southern parts of the Netherlands, cultural layers are absent, while wood, bones, seeds, etcetera, are not preserved. This is true for most of the sandy soils in northwestern Europe.

Only in special occasions also organic material is preserved, for instance in wells that were dug to extract fresh ground water. Especially in the southern Netherlands this was widespread practice since the Bronze Age. Yet, until the Roman Period these wells were generally open pits in the lower part of which people place some kind of wooden lining to prevent collapse (Fokkens *et al.* 2019). These wells contain very few finds that date to the period of use, but when they were filled after use, artifacts and eco facts became trapped; these constitute our main source of information.

Yet in the river deltas of the Meuse, Rhine, Scheldt and Vecht better preservation conditions prevailed. Especially from the northwest and west of the Netherlands we have ample evidence for (Late) Neolithic and Bronze Age settlements with sometimes excellent preservation circumstances for organic material. Here we have much more indications for agricultural practices and for artifact assemblages that can be related directly to individual farms. Several of these settlement sites have been the subject of large-scale excavations, some of these already in the nineteen sixties. Famous are the settlements of Elp (Waterbolk 1964), Dalen and Angelslo-Emmerhout (Kooi 1991; 2008) in the northeastern Netherlands; Bovenkarspel, Andijk and Hoogkarspel (Roessingh 2018) in the northwestern Netherlands, Molenaarsgraaf (Louwe Kooijmans 1974) in the central Netherlands and Oss in the south (Fokkens 1998b; Fokkens *et al.* 2019). And since the Valetta convention was ratified, many more sites have been excavated: Westfrisiaweg (Roessingh and Tol 2019), Enkhuizen (Roessingh and Lohof 2011; van der Linde and Hamburg 2014), Eigenblok (Jongste and van Wijngaarden 2002), Den Haag (Stokkel and Bulten 2017), Hattumerbroek (Hamburg *et al.* 2011), Son-en-Breugel Ekkersrijt (de Jong and Beumer 2011; de Jong and Beumer 2013) and many others (see also Fokkens *et al.* 2018). These excavations have yielded a wealth of data on settlement structure, on farm structure and development, and on economy. Most of them have been published now because of the publication rules connected to research in context of the Valetta treaty.[1]

1 These excavation reports are accessible through the Data Archiving and Networked Services (DANS) of the Royal Dutch Academy of Sciences (KNAW).

WHAT CAN SETTLEMENT DATA TELL US

In general settlement data contains information about farms and farm structure, about settlement structure, arable land, and economy, and in favourable cases also about (differences in) material culture. Often this data is indirect but may yield far more than direct evidence. It all depends on our perspective. If we are set on finding evidence for inequality and elites to support the narratives derived from burial data, differences in the structure of houses, or in farm size or material found in them, might be interpreted as direct evidence for social inequality.

Kristiansen and Larsson, for instance, suggested that one of the houses excavated in Legård (northern Jutland) was a chiefly hall (Kristiansen and Larsson 2005). The reasoning behind this, is that their political economic view of the Nordic Bronze Age, cattle is considered 'the most costly prestige good' (Kristiansen and Larsson 2005, 278). According to Earle cattle was in the Late Bronze Age even 'produced' for long-distance trade involving metals (Earle 2002, 309). This suggests that especially chiefs and elites had access to this 'prestige good'. Kristiansen and Earle find support for this idea in the fact that in one of the sites they helped excavate in Thy, there is one large house (Legård III) with evidence for cattle stalling, while other houses in that settlement lack the same evidence. That house is subsequently indicated as the chiefly hall, and used as evidence that only chiefs owned cattle (Kristiansen and Larsson 2005).

This argument sounds plausible, but it has been criticised as selective reading of the data. According to one of its excavators, Jens Henrik Bech, the Legård III 'hall' is not as unique as suggested by Kristiansen. Referring to Bronze Age farms in Jutland, Bech and Haack Olsen state:

"*The presence of byres, therefore, does not indicate a monopolization of cattle-keeping among the larger households and higher level of Bronze Age society.*"
(Bech and Haack Olsen 2013, 19)

as suggested by Timothy Earle and Kristian Kristiansen (2010, 226). And that observation is not restricted to Jutland: we know of many more farms with stalls (Fig. 1). Actually, in the northeastern Netherlands most farms have archaeologically visible stall partitions, for instance at Elp, Emmerhout and Dalen (cf. Waterbolk 1964; Kooi 2008; Donat 2018; Assendorp 1997).

Yet, in the western, central, and southern Netherlands, or indeed in much of northwestern Europe, there is hardly any evidence for stalls. But that is no reason to assume that in those farms no livestock was stalled. We have in fact massive evidence for the opposite, for instance from West-Frisia. There none of the farms shows evidence for stalls, nor are there large differences in farm size (Roessingh 2018). The evidence comes from another source, however: all these farms (well over 100 excavated), were individually surrounded by narrow house ditches. These contained well preserved animal and organic remains. So even if none of the farms have visible remains of byres, we know that cattle was present in abundance, making up for 80 % of the animal remains (IJzereef 1981; van Amerongen 2016). Since the structure of all farms was similar, with a somewhat larger opening in the house ditch on the eastern side, suggesting an entrance for life stock, we suspect that all farmers had cattle (Roessingh 2018; van Amerongen 2016). Why are the stalls invisible to us: either because cattle was not tethered in stall boxes, or the posts for these stalls were not structural and therefore not dug in as deep as the roof supports, or the animals were tethered to horizontal poles that were fastened between the roof supports of the farm.

So, there are several arguments based on a discussion of direct evidence, to suggest that most, if not all, farmers owned and stalled cattle in their farms: not just in the Netherlands, also in northern Europe. However, I suggest we can generate additional arguments and learn much more by analysing farming life and farming practices in a more fundamental way. With that I mean that we should try to find out how farming life was constituted, and what was possible and what not in terms of sustainable farming. Could a Bronze Age community even support an army or consist of a few chiefs that possessed all cattle and ruled over many commoners and slaves?

In the following I will try to give a few examples of a more fundamental analysis of farming practices and their possibilities and impossibilities, and at the same time show that if you do so, gender roles and labour division can be discussed in a well-considered manner avoiding gender-stereotypes.

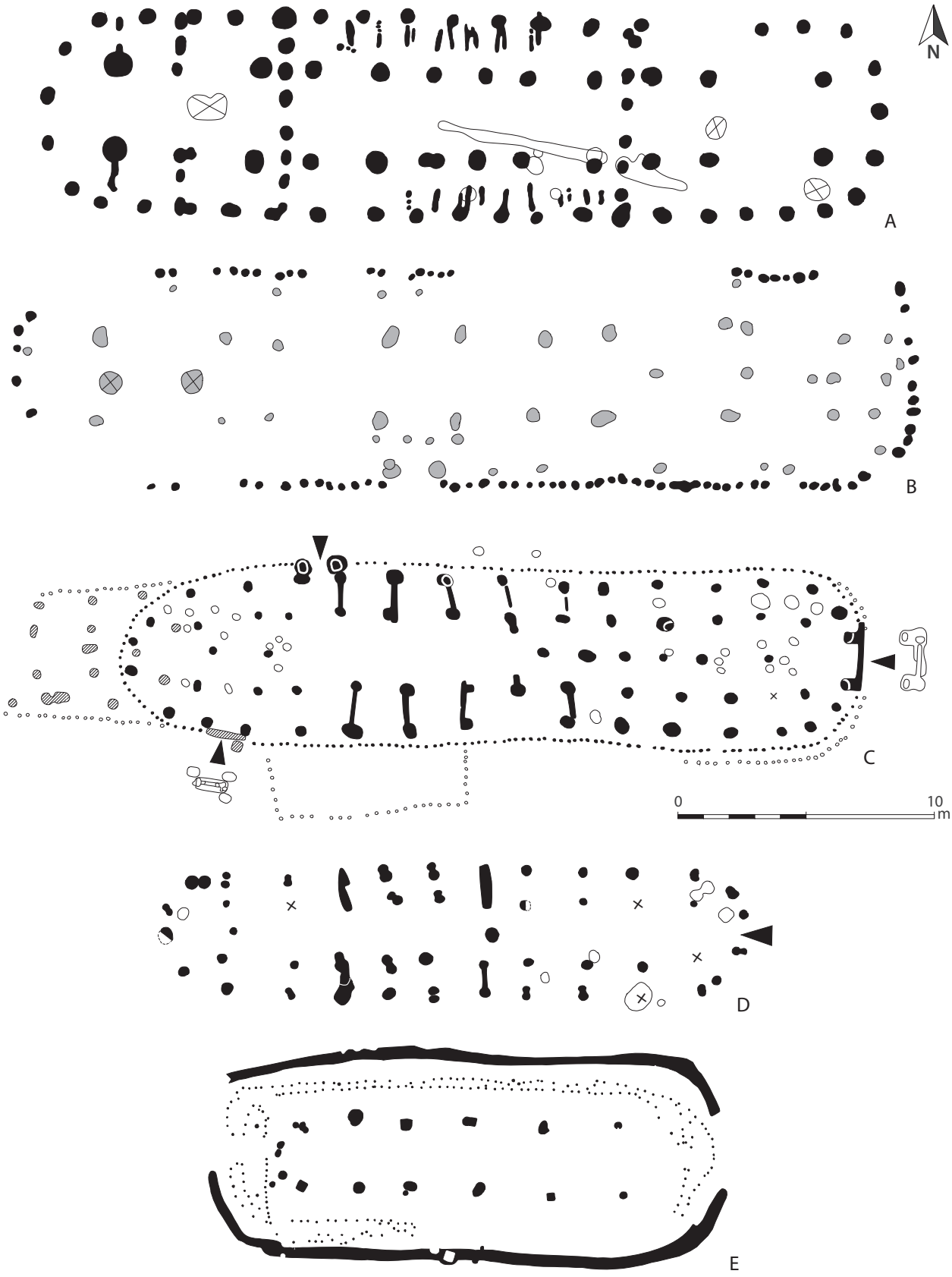

*Fig. 1. Examples of houses with visible byres: houses of type Højgård: **A** Legård III; **B** Øster Ørbaek, type Emmerhout; **C** Angelsoo-Emmerhout 32; **D** Dalen 2 (after Donat 2018, 38, 50); in comparison one of the West-Frisian houses of type Zijderveld: **E** Andijk 5 (after Roessingh 2018, 18).*

THE REQUIREMENTS OF PLOUGH AGRICULTURE

A discussion Late Neolithic and Bronze Age farming should depart from the knowledge that we are dealing with plough agriculture. We have massive evidence for Late Neolithic plough marks, both in settlement context and in burial context (*e.g.* Thrane 1989; Isaakidou 2011). In the Netherlands, the oldest marks are found in Vlaardingen, TRB, Corded Ware and Bell Beaker context (Goossens 2008; Fokkens *et al.* 2018). This must have resulted in a major transformation of the landscape, but also of farming life itself (Fokkens 1986; 1998b). Here I will not discuss the changes that occurred around 3000 BCE but focus on some of the aspects of plough/ard agriculture.

In the first place we should realise that to plough the land, the soil needs to be free of tree stumps and stones. If not, the ard will get stuck all the time. The use of the ard therefore implies open spaces that probably were not allowed to regenerate into forest again (Fokkens 1982; Boserup 1965; Carlstein 1982; Shukurov *et al.* 2015). This is to some extent supported by evidence from burial mounds and settlements:

"*The ploughing over of settlements or the placing of settlements on ploughed areas seems just as typical as the placing of burial monuments on ploughed surfaces.*"
(Thrane 1989, 118)

Also in Bronze Age West-Frisia we have ample evidence for ploughland being built upon, and vice versa, farmsteads being converted to plough land (Roessingh 2018).

We also know that from the Late Neolithic onwards, farmed plots were not just small garden plots. We have ample evidence for plots that must have covered 1500 m^2 to half an hectare or more (Fokkens 1982; Knippenberg 2018; Fokkens *et al.* 2017; for more references Thrane 1989, 116). However, the limits of prehistoric arable fields have hardly been explored. Most of the evidence is based on minimum numbers due to limited excavation surfaces. At Oostwoud we tried to explore the limits of the Late Neolithic arable, and found it extended over an area of at least 350 x 100 m, although not all of it may have been in use at the same time (Fokkens *et al.* 2017).

Depending on the crop:yield ratio used, a hectare or less will feed a family of six if they were dependant on arable farming alone (Fokkens 1998a). That calculation is based on an estimate of a 1:30 crop yield factor per hectare averaged over 15 years in Butser farm experiments in unfertilized soil (Reynolds 1987; Reynolds 1992). Since we know that Bronze Age fields were fertilized (see below), this factor seems realistic. The average amount harvested per ha at Butser farm was 2.08 metric tons for emmer wheat (Reynolds 1992). For the Middle Ages 250 kg of bread grain per year per adult was considered sufficient if dependent for 100 % on grain (Slicher van Bath 1976, 76). I assume that also in Prehistory this was a valid number, which implies that for a family of four adults a yield of at least 1000 kg would be needed, if they only were fed on grain. Given the fact that their diet most was more varied, fields of 0,5–1.0 ha may have been sufficient to feed even an extended family (Fokkens 1998a; Fokkens 2003).

Since continued use of arable depletes the soil eventually, some form of manuring reduces risk of crop failure and enhances yield stability (Shukurov *et al.* 2015). This may have been done with household waste, as is suggested by the presence of ceramic pottery in arable land (*e.g.* Fokkens *et al.* 2017; Wilkinson 1982). Yet, that cannot have been sufficient. Samples of Late Neolithic and Bronze Age grain shows high levels of nitrogen, leading to the conclusion that the fields must have been heavily manured (Bakels 2019; Bogaard and Jones 2007; Kanstrup *et al.* 2014; van Amerongen 2016). The use of the ard therefore marks the beginning of a system of mixed farming: live stock was no longer just needed for food and clothing, but also became a necessary element of arable farming for drawing the plough, and for manure (Fokkens 2005a). I have stated earlier that this may have been one of the reasons for the origin of the farms that housed people and livestock under the same roof: as a practical way to collect dung, and because livestock was a crucial element for arable farming and therefore of high social value (Fokkens 1999; Fokkens 2003; Fokkens 2009; Brusgaard *et al.* 2019; see also Bakels 1997; Shukurov *et al.* 2015). Of course this implies that cattle also had economic value, and we have some evidence for long distance exchange, but in Bronze Age West-Frisia by far the majority (94,5 % of 85 samples) was local/regional (Brusgaard *et al.* 2019).

A system of mixed farming the fields implies that arable farming was impossible without livestock, especially cattle. To suggest that only the elite possessed cattle means that the system was unsustainable. To survive, every farmer needed to have and exploit cattle. A chief never could own and stall enough cattle to manure and plough the fields that were needed to also support his slaves and commoners. Nor could he summon his subordinates to produce food if they were not allowed to have cattle and work their own fields. This shows that the political economic perspective of the Bronze Age could benefit from a more holistic view of Bronze Age farming.

Fig. 2. Farmer Bikram Daugi ploughs with his oxen as Dhansa Bhandari walks behind sowing maize seed (licenced under creative commons, source: International Wheat and Maize improvement centre; https://www.flickr.com/photos/cimmyt/28589067167 ; last access 14th December 2023).

SETTLEMENT DATA AND GENDER ROLES

A different perspective to farming life and settlements also may bring a more balanced view of gender roles into view. Presently the grand narrative of the Bronze Age is about male elites and warriors. Most of the arguments focus on status, power, trade, monopolisation of critical resources, *etc.* Rich female graves do exist, but are frequently interpreted as the result of 'inter-chief alliances through intermarriage with elite foreign women' (*e.g.* Frei *et al.* 2015, 5 referring to Kristiansen and Larsson 2005). Yet settlement evidence can give us other information if we are willing to read it that way. Let us take again ploughing with the ard again as an example.

Often ploughing is visualised as a two-person job: one person leads the team of draught animals, the other guides the ard and determines its angle and depth. If we consider the ard only as a means to work the field, the focus probably would be still on the male role, because men are generally visualized as guiding the ard and leading them the team of animals. But in modern day farming communities that still use the ard, yet another person is involved. In Nepal, for instance, women directly follow the plough, planting maize seeds (Fig. 2). The reason is that whereas modern ploughs turn the sods, an ard only opens the soil, and effectively creates a seed drill. Sowing in seed drills is leads to higher yields than broadcast sowing, and is more effective for weeding and harvesting (Steensberg 1979). Sowing in these drills is most efficient if that takes place shortly after ploughing, and if the seeds are somehow covered again. Therefore, in modern-day use of the ard, sowing is done by a third person (often a woman) in coordination with ploughing. It is not strange to suggest (even if that is not a particularly good argument) that also in the Late Neolithic and the Bronze Age, women were involved in ploughing and sowing. If that is true, this would mean their role was technically may be different from that of the men, but of equal importance for the outcome. In this respect, I read equality for men and women between the lines, even if their tasks may have been different. In addition, how manure and household waste was collected and brought over the fields is unknown, but I suggest a similar cooperation of genders to ensure the right outcome.

We can sum up many more tasks that would require skill and experience to conduct; what about weeding, grazing cattle, harvesting, but also deciding how much grain to store for sowing next season. If men indeed were away regularly to function as warriors, raiders, and traders on behalf of the chiefs, much of these tasks and expertise must be attributed to women. Not in the last place because if the men did not return from the battlefield, farming life and knowledge about its practicalities, would have to be continued. This suggests to me that women were perfectly capable of managing farming life on their own accord, even if additional (man)power was needed during in times of time pressure, for instance during ploughing and sowing, and during harvest.

The evidence from settlements shows that there were far more tasks that required all person power possible: in West-Frisia digging circles for storage of grain, in other areas building and rebuilding granaries, maintaining fences, digging waterholes and wells, grazing cattle, gathering winter fodder, building and maintaining houses, carts, boats, *etc.*, *etc.* Therefore, my reading of daily Bronze Age life, is that warriorhood must have been far less time-consuming than the grand narratives based on burial studies suggest. Maybe that is because in burial ritual 'normal' aspects of farming life remained invisible, while very specific qualities of personhood were enhanced in order to create valuable ancestors (Fokkens 2005b; 2012; Louwen 2021).

TEXTILE: OTHER NECESSITIES OF DAILY LIFE

A more holistic analysis of farming life and practices can bring things to light that are otherwise neglected or reduced to 'just' economic values. An element that is often underestimated, is the production of textiles from plant fibres like nettle and flax, and from wool. Flax was produced for 'linen' and weaving in Late Neolithic Europe (Feldtkeller and Schlichterle 1987; Maier and Schlichterle 2011), while woollen garments were woven since at least the Bronze Age, especially from *c.* 1600 onwards (Haughton *et al.* 2021; Grömer and Saliari 2018). It may be considered a gender stereotype to suggest that women were producing textiles in the past. But given the craftmanship, effort, time and knowledge involved in the production of textiles I would say the opposite is true: it would be misogynistic to suggest that this was a male task. And apart from that, if men were indeed warriors most of the time, they hardly could have played a prominent role in such time-consuming tasks. For that reason, I prefer to consider women the 'main engine' of textile production, with other household members — including men — undoubtedly of importance to assist in production of fibres, and in raising, feeding and herding livestock.

I know that much of this reading between the lines, but much of the grand narratives about warrior elites are based on reading between (other) lines as well. So, I offer only an alternative view, one that can be followed up by more research in the future. Research into crafts, and craft(wo)manship, the knowledge and material needed, the time needed, *etc. etc.* is still largely still lacking. Equally research into ancient farming and farming practices, time and knowledge involved is limited. Experiments at Butser farm and Lejre in ploughing and arable farming have been executed but are not really very well documented. Time Geography, for instance as discussed by Carlstein (Carlstein 1982), has made good contributions to the analysis of time management in shifting cultivation and short fallow cultivation, but his work and that of space-time geographers in general, has had little impact or even attention in archaeological circles. Generally, Prehistoric farming and settlement have been approached from an academic (urban based) perspective that reduce farming and farmers to an almost unhuman object of economic manipulation. To counteract that, we also need a farmer perspective. A perspective that studies the social aspects of farming life and of interaction with animals (cf. Brusgaard *et al.* 2019). In that respect I'm anxious to see the results of the new ERC research that prof. Joanna Brück has started (ERC 101055195 ANSOC: Animals and Society in Bronze Age Europe).

A NEW GENERATION OF RESEARCH QUESTIONS

With the examples given above, I hope to have demonstrated that if we really want to investigate the complexity of Late Neolithic and Bronze Age life, we need to start asking different questions. We must understand the complexity of daily life, and the social, ritual, ánd economic processes involved. If we really want to understand prehistoric societies, we need to generate holistic views of the complex ways in which daily life, ritual, and notions of the supernatural were conceived in a coherent cosmology (cf. Bradley 2005; Roberts 1996). In my view this asks for a reading between the lines of the different sets of data that we have, or rather may be for listening to the data. Too often we jump to conclusions determined by current paradigms, as

for instance is the case with discussions of social inequality and hierarchy. Using plough marks again as an example: we could register them as evidence for the intensification of arable farming. Yet in the above we have also seen that there is much more to it: the evidence shows that these ploughed lands were a subject to short fallow or crop rotation, that they were manured and that they were sown in rows instead of broad cast. This may mean that arable land and its history of cultivation and cultivators became part of a cosmology that connected the ancestors to the land as well (cf. de Coppet 1985). Ploughing and sowing thus become not just economic acts, but cosmologically loaded activities for all of its actors, including the animals, objects, and people involved. Bradley suggests that ploughing scenes as depicted in the Mont Bégo area of southern France and Bohuslän in southern Sweden are not just scenes of daily life (Bradley 2005, 86). The fact that they are depicted on rock, as well as the fact that ploughs are deposited in specific bogs, demonstrates that there was more to it than just a daily practice.

This is just one example, but it shows that a more holistic approach to data can give different insights, also with respect to gender roles. Scientific data generated from multi-proxy analyses (use-wear, isotope analysis, aDNA of bones and soil) can definitely contribute to a better understanding of the complexity daily life and of gender roles in the division of labour (*e.g.* Masclans *et al.* 2021).

CONCLUDING REMARKS

Hopefully, I demonstrated that settlement archaeology and a more holistic approach to our data can provide more balanced images of past societies. Similarly, we must study culture change much more as a process than as a given. Many scholars now seem to accept that migration caused much of the culture change that we witness at the beginning of the Late Neolithic. And yes, I realise that aDNA research appears to support the idea of change through migration. But that explanation is too simple: aDNA research shows us outcomes of a process, but not the process itself. As Martin Furholt has recently explained, much of our understanding of these changes rely

> "*on the flawed and outdated concept that archaeological classification units — usually referred to as 'archaeological cultures' — would represent distinct and clearly delineated human groups of common genetic ancestry and social identity.*" (Furholt 2021b, 482)

Furholt suggests that the innovation complex of changes could never have happened in closed homogenous communities. He therefore argues that we should envision highly socially mobile and more open heterogenous societies that stimulate and enhance innovation and change (Furholt 2021a). I fully agree. I also think that part of the explanation for more open mobile societies can be found in the new type of farming life that was the consequence of plough agriculture. This made farmsteads more place constant, produced better yield in support of more people, may even have raised the survival rate of offspring. That could be one of the reasons for higher mobility, in terms of networking and marriage alliances, but also in movement of families and people.

REFERENCES

van Amerongen, Y., 2016. *Wild West Frisia: the role of domestic and wild resource exploitation in Bronze Age subsistence*. Leiden: Leiden University Press.

Arnoldussen, S. and Fokkens, H., 2008. *Bronze Age settlements in the Low Countries*. Oxford: Oxbow books.

Assendorp, J.J., 1997. *Forschungen zur bronzezeitlichen Besiedlung in Nord- und Mitteleuropa. Internationales Symposium vom 9.–11. Mai 1996 Hitzhacker*. Espelkamp: Verlag Marie Leidorf.

Bakels, C., 2019. Baselines for $\delta 15N$ values of cereals retrieved from archaeological excavations. *Archaeometry* 61(2), 470–477.

Bakels, C.C., 1997. The beginnings of manuring in western Europe. *Antiquity* 71, 442–445.

Bech, J.-H. and Haack Olsen A., 2013. Early Bronze Age houses from Thy, Northwest Denmark. *In:* K.H. Willroth, ed. *Siedlungen der älteren Bronzezeit. Beiträge zur Siedlungsarchäologie und Paläoökologie des zweiten vorchristlichen Jahrtausends in Südskandinavien, Norddeutschland und den Niederlanden*, Studien zur nordeuropäischen Bronzezeit 1. Neumünster: Wachholtz, 9–32.

Bertemes, F. and Meller, H., eds., 2010. *Der Griff nach den Sternen. Wie Europas Eliten zu Macht und Reichtum kamen. Internationales Symposium in Halle (Saale) 16–21. Februar 2005*, Tagungen des Landesmuseums für Vorgeschichte Halle 5. Halle (Saale): Landesamt für Denkmalpflege und Archäologie Sachsen-Anhalt, Landesmuseum für Vorgeschichte.

Bogaard, A. and Jones, G., 2007. Neolithic farming in Britain and central Europe: contrast or continuity. *In:* A.W.R. Whittle and V. Cummings, eds. *Going Over: The Mesolithic-Neolithic transition in North-West Europe*, British Academy Scholarship Online. London: The British Academy, 357–375.

Boserup, E., 1965. *The conditions of agricultural growth. The Economic of agricultural change under population pressure*. London: Allen & Unwin.

Bradley, R., 2005. *Ritual and Domestic Life in Prehistoric Europe*. London: Routledge.

Brusgaard, N.Ø., Fokkens, H. and Kootker, L.M., 2019. An isotopic perspective on the socio-economic significance of livestock in Bronze Age West-Frisia, the Netherlands (2000–800 BCE). *Journal of Archaeological Science: Reports* 27, 101944.

Carlstein, T., 1982. *Time resources, society and ecology. On the capacity for human interaction in space and time. Vol. 1: Preindustrial societies*. London: Allen & Unwin.

de Coppet, D., 1985. ...Land owns people. *In:* R.H. Barnes, D. de Coppet and R.J. Parkin, eds. *Context and levels, Anthropological essays on hierarchy*. Oxford: Oxford University Anthropological Society, 78–90.

Donat, P., 2018. *Häuser der Bronze- und Eisenzeit im mittleren Europa eine vergleichende Untersuchung*. Langenweissbach: Beier & Beran.

Earle, T., 2002. *Bronze Age economics. The beginnings of political economies*. Boulder, Oxford: Westview Press.

Earle, T., 2007. *How chiefs come to power. the political economy in Prehistory*. Cambridge: Cambridge University Press.

Kristiansen, K. and Earle, T.K., eds., 2010. *Organizing Bronze Age Societies. The Mediterranean, Central Europe, and Scandinavia compared*. Cambridge: Cambridge Univ. Press.

Erickson, C.L., 2006. Intensification, political economy, and the farming community; in defense of a bottom-up perspective of the past. *In:* J. Marcus and C. Stanish, eds. *Agricultural Strategies*. Los Angelos: Cotsen Institute, 233–265.

Feldtkeller, A. and Schlichtherle, H., 1987. Jungsteinzeitliche Kleidungsstücke aus Ufersiedlungen des Bodensees. *Archäologische Nachrichten aus Baden* 38/39, 74–83.

Fokkens, H., 1982. Late neolithic occupation near Bornwird (province of Friesland). *Palaeohistoria* 24, 91–113.

Fokkens, H., 1986. From shifting cultivation to short fallow cultivation: Late Neolithic culture change in the Netherlands reconsidered. *In:* H. Fokkens, P.M. Banga and M. Bierma, eds. *Op zoek naar mens en materiële cultuur. Feestbundel aangeboden aan J.D. van der Waals ter gelegenheid van zijn emeritaat.* Amsterdam: Rijksuniversiteit Groningen, 5–21.

Fokkens, H., 1996. The Maaskant project. Continuity and change of a regional research project. *Archaeological Dialogues* 3(2), 196–215.

Fokkens, H., 1998a. *Drowned Landscape. The Occupation of the Western Part of the Frisian-Drenthian Plateau, 4400 BC–AD 500*. Assen: Van Gorcum.

Fokkens, H., 1998b. *The Ussen project: the first decade of excavations at Oss*. Leiden: Faculty of Archaeology.

Fokkens, H., 1999. Cattle and martiality. Changing relations between man and landscape in the Late Neolithic and the Bronze Age. *In:* C. Fabech and J. Ringtved, eds. *Settlement and landscape. Proceedings of a conference in Århus, Denmark, May 4–7 1998*. Århus: Jutland Archaeological Society, 35–43.

Fokkens, H., 2003. The longhouse as a central element in Bronze Age daily life. *In:* J. Bourgeois, I. Bourgeois and B. Charetté, eds. *Bronze Age and Iron Age communities in North-Western Europe.* Bruxelles: Vlaams Kennis- en Cultuurforum, 9–38.

Fokkens, H., 2005a. Mixed farming societies: synthesis. *In:* L.P. Louwe Kooijmans, P.W. van den Broeke, H. Fokkens and A.L. van Gijn, eds. *The Prehistory of the Netherland*. Amsterdam: Amsterdam University Press, 463–476.

Fokkens, H., 2005b. Voorbeeldige voorouders. Graven naar de ideeënwereld van prehistorische boerengemeenschappen. (Rede uitgesproken door Prof. Dr. H. Fokkens bij de aanvaarding van het ambt van hoogleraar op het gebied van de Europese Prehistorie aan de Universiteit Leiden op 15 november 2005). Leiden: Universiteit Leiden.

Fokkens, H., 2009. Die Wirtschaft der Nordischen Bronzezeit: mehr als Getreide sähen und Vieh züchten. *In:* M. Bartelheim and H. Stäuble, eds. *Die wirschaftlichen Grundlagen der Bronzezeit Europa*. Rahden/Westfalen: Verlag Marie Leidorf, 85–104.

Fokkens, H., 2012. Access to origins: about the meaning of continuity and discontinuity in the use of barrow 'cemeteries'. *In:* D. Bérenger, J. Bourgeios, M. Talon and S. Wirth, eds. *Gräberlandschaften der Bronzezeit. Internationales Kolloquium zur Bronzezeit, Herne, 15.–18. Oktober 2008*. Darmstadt: Philipp von Zabern, 553–572.

Fokkens, H., van As, S. and Jansen, R., 2019. *The Oss-North project. The second decade of excavations at Oss 1986–1996*. Leiden: Sidestone Press.

Fokkens, H., Steffens, B.J.W. and van As, S.F.M., 2018. *Farmers, fishers, fowlers, hunters. Knowledge generated by development-led archaeology about the Late Neolithic, the Early Bronze Age and the start of the Middle Bronze Age (2850–1500 cal BC) in the Netherlands*. Amersfoort: Rijksdienst voor het Cultureel Erfgoed.

Fokkens, H., Veselka, B., Bourgeois, Q., Olalde, I. and Reich, D., 2017. Excavations of Late Neolithic arable, burial mounds and a number of well-preserved skeletons at Oostwoud-Tuithoorn: a re-analysis of old data. *Analecta Praehistorica Leidensia* 47, 95–150.

Frei, K.M., Mannering, U., Kristiansen, K., Allentoft, M.E., Wilson, A.S., Skals, I., Tridico, S., Nosch. M.-L., Willerslev. E., Clarke, L. and Frei, P., 2015. Tracing the dynamic life story of a Bronze Age Female. *Nature* 5, 10431.

Furholt, M., 2021a. Innovations and social heterogeneity in Late Neolithic Europe. *In:* F. Klimscha, S. Hansen and J. Renn, eds. *Contextualising Ancient Technology,* Berlin Studies of the Ancient World 73. Berlin: Excellence Cluster Topoi, 187–196.

Furholt, M., 2021b. Mobility and social change: understanding the european Neolithic period after the archaeogenetic revolution. *Journal of Archaeological Research* 29(4), 481–535.

Furholt, M., Grier, C., Spriggs, M. and Earle, T., 2020. Political economy in the Archaeology of emergent complexity: a synthesis of bottom-up and top-down approaches. *Journal of Archaeological Method and Theory* 27(2), 157–191.

Goossens, T.A., 2008. *Opgraving Hellevoetsluis-Ossenhoek. Een nederzetting van de Vlaardingen-groep op een kwelderrug in de gemeente Hellevoetsluis*. Leiden: Archol bv.

Graeber, D. and Wengrow, D., 2021. *The dawn of everything. A new history of humanity*. Dublin: Allan Lane.

Grömer, K. and Saliari, K., 2018. Dressing Central European prehistory – the sheep's contribution: An interdisciplinary study about archaeological textile finds and archaeozoology. *Annalen des naturhistorischen Museums in Wien, Serie a* 120, 127–156.

Hamburg, T., Lohof, E. and Quadflieg, B., 2011. *Bronstijd opgespoord. Archeologisch onderzoek van prehistorische vindplaatsen op Bedrijvenpark H2O – plandeel Oldebroek (provincie Gelderland)*. Leiden: Archol bv.

Haughton, M., Sørensen, M.L.S. and Bender Jørgensen, L., 2021. Bronze Age Woollen Textile Production in England: A Consideration of Evidence and Potentials. *Proceedings of the Prehistoric Society* 87, 173–188.

IJzereef, G.F., 1981. *Bronze Age Animal Bones from Bovenkarspel*. Amersfoort: Rijksdienst voor het Oudheidkundig Bodemonderzoek.

Isaakidou, V., 2011. Farming regimes in Neolithic Europe: gardening with cows and other models. *In:* A. Hadjikoumis, E. Robinson and S. Viner, eds. *Dynamics of Neolithisation in Europe: Studies in honour of Andrew Sherratt*. Oxford: Oxbow Books, 90–112.

de Jong, T. and Beumer, S., 2011. *Archeologisch onderzoek knooppunt Ekkersrijt-IKEA, gemeente Son en Breugel Deel 1: Wonen bij een grafheuvel uit de midden-bronstijd Inventariserend veldonderzoek proefsleuven en opgraving*. Eindhoven: Archeologisch Centrum Eindhoven en Helmond.

de Jong, T. and Beumer, S., 2013. *Opgraving knooppunt Ekkersrijt-IKEA, gemeente Son en Breugel Deel 2: Prehistorische bewoning in Ekkersrijt*. Eindhoven: Archeologisch Centrum Eindhoven en Helmond.

Jongste, P.F.B. and van Wijngaarden, G.J., 2002. *Archeologie in de Betuweroute: Het Erfgoed van Eigenblok. Bewoningssporen uit de Bronstijd te Geldermalsen*. Amersfoort: Rijskdienst voor het Oudheidkundig Bodemonderzoek.

Kanstrup, M., Holst, M.K., Jensen, P.M., Thomsen, I.K. and Christensen, B.T., 2014. Searching for long-term trends in prehistoric manuring practice. δ 15 N analyses of charred cereal grains from the 4th to the 1st millennium BC. *Journal of Archaeological Science* 51, 115–125.

Knippenberg, S., 2018. *Laatneolithische en vroege bronstijdarcheologie langs de Westfrisiaweg (N307). De resultaten van de opgravingen nabij de Noorderboekert en de Rijweg*. Leiden: Archol bv.

Kooi, P.B., 1991. Een nederzetting uit de midden-bronstijd op het Huidbergsveld bij Dalen. *Nieuwe Drentse Volksalmanak* 108, 104–117.

Kooi, P.B., 2008. Nederzettingen uit de bronstijd en ijzertijd in Angelslo-Emmerhout (gem. Emmen). *Palaeohistoria* 49/50, 327–373.

Kristiansen, K., 1987. Center and periphery in Bronze Age Scandinavia. *In:* M.J. Rowlands, M. Larsen and K. Kristiansen, eds. *Centre and Periphery in the Ancient World*. Cambridge: Cambridge University Press, 74–85.

Kristiansen, K., 1991. Chiefdoms, states, and systems of social evolution. *In:* T.K. Earle, ed. *Chiefdoms – Economy, Power and Ideology*. Cambridge: Cambridge University Press, 16–42.

Kristiansen, K., 2021. Towards a new paradigm. The Third Science Revolution and its Possible Consequences in Archaeology. *Current Swedish Archaeology* 22(1), 11–34.

Kristiansen, K. and Larsson, T.B., 2005. *The Rise of Bronze Age Society: Travels, Transmissions and Transformations*. Cambridge: Cambridge University Press.

van der Linde, C.M. and Hamburg, T.D., 2014. *Bronstijdbewoning in Gommerwijk West – West. Archeologisch onderzoek in Enkhuizen – Haling 13*. Leiden: Archol bv.

Louwe Kooijmans, L.P., 1974. *The Rhine/Meuse Delta; four studies on its prehistoric occupation and Holocene geology*. Leiden: Instituut voor Prehistorie.

Louwen, A., 2021. *Breaking and making the ancestors: piecing together the urnfield mortuary process in the Lower-Rhine-Basin, ca. 1300–400 BC*. Leiden: Sidestone Press.

Maier, U. and Schlichtherle, H., 2011. Flax cultivation and textile production in Neolithic wetland settlements on Lake Constance and in Upper Swabia (south-west Germany). *Vegetation History and Archaeobotany* 20(6), 567–578.

Masclans, A., Hamon, C., Jeunesse, C. and Bickle, P., 2021. A sexual division of labour at the start of agriculture? A multi-proxy comparison through grave good stone tool technological and use-wear analysis. *PLoS ONE* 16(4), e0249130.

Meller, H., 2017. Armies in the Early Bronze Age. An alternative interpretation of Únětice Culture axe hoards. *Antiquity* 91(360), 1529–1545.

Reynolds, P., 1987. *Butser Ancient Farm Yearbook 1986*.

Reynolds, P., 1992. Crop yields of the prehistoric cereal types emmer and spelt: the worst option. *In:* P.C. Anderson, ed. *Préhistoire de l'agriculture, Nouvelles approches expérimentales et ethnographiques*, Monographie du CRA 6. Paris: C.N.R.S., 383–393.

Roberts, B.K., 1996. *Landscapes of settlement. Prehistory to the present*. London: Taylor & Francis.

Roessingh, W., 2018. *Dynamiek in beeld. Onderzoek van Westfriese nederzettingen uit de bronstijd*. Leiden: Sidestone Press.

Roessingh, W. and Lohof, E., eds., 2011. *Bronstijdboeren op de kwelder. Archeologisch onderzoek in Enkhuizen-Kadijken*. Amersfoort: Archeologisch Diensten Centrum.

Roessingh, W. and Tol, A., eds., 2019. *Archeologie langs de Westfrisiaweg. Opgravingen van vindplaatsen uit de late prehistorie, middeleeuwen en Nieuwe tijd in het tracé van de Westfrisiaweg*. Leiden: Archol bv.

Shukurov, A., Sarson, G., Videiko, M., Henderson, K., Shiel, R., Dolukhanov, P. and Pashkevich, G., 2015. Productivity of Pre-Modern Agriculture in the Cucuteni-Trylillia Area. *Human Biology* 87(3) 235–282.

Slicher van Bath, B.H., 1976. *De agrarische geschiedenis van West-Europa 500–1850*. Utrecht: Spectrum.

Steensberg, A., 1979. *Droved. An experiment in Stone Age agriculture: burning, sowing and harvesting*. Copenhagen: National Museum of Denmark.

Stokkel, P.J.A. and Bulten, E.E.B., eds., 2017. *De Wateringse Binnentuinen Gemeente Den Haag. Een Vlaardingennederzetting in het Wateringse Veld*. Den Haag: Gemeente Den Haag.

Thrane, H., 1989. Danish Plough-Marks from the Neolithic and Bronze Age. *Journal of Danish Archaeology* 8, 111–125.

Waterbolk, H.T., 1964. The Bronze Age settlement of Elp. *Helinium* 4, 97–131.

Wilkinson, T.J., 1982. The Definition of Ancient Manured Zones by Means of Extensive Sherd-Sampling Techniques. *Journal of Field Archaeology* 9(3), 323–333.

Ceramic Technology of the Neolithic and the Bronze Age
Transformation in Northern and Central Europe

Jutta Kneisel

KEYWORDS: *chaîne opératoire, ceramic production, household production, Funnel Beaker, labour expenditure*

Abstract

The article deals with the experimental production of Funnel Beaker pottery, as well as the type and duration of decoration in comparison to Bronze Age pottery in Northern and Central Europe. Production times, surface treatment and tools are presented. Based on the hypothesis that the decoration of Neolithic pottery is more elaborated than the more simply decorated or undecorated vessels of the Bronze and Iron Ages, the *chaînes opératoires* were documented, the time for the individual working steps measured and compared. Ethnographic and archaeological observations are also used to investigate the question of household production. Did every household in the European Neolithic and the Bronze Age have the technological and practical prerequisites to produce pottery? Or was it rather a matter of specialised groups that produced ceramics, so-called "workshops", as is taken for granted for metal production? While the article considers the latter scenario to be more plausible, the experiments show that the time required to produce Neolithic and Bronze Age vessels remains almost the same.

Zusammenfassung

Der Artikel beschäftigt sich mit experimenteller Herstellung von Trichterbecherkeramik und der Art und Dauer der Verzierung im Vergleich zur bronzezeitlichen Keramik in Nord- und Mitteleuropa. Herstellungszeiten, Oberflächenbearbeitung und Werkzeuge werden vorgestellt. Ausgehend von der These, dass die Verzierung der neolithischen Keramik aufwändiger als die einfacher verzierten oder unverzierten Gefäße der Bronze- und Eisenzeit ist, wurden die chaîne opératoire *dokumentiert, die Zeit gemessen und für die einzelnen Arbeitsschritte ausgewertet. Anhand von ethnografischen und archäologischen Beobachtungen wird der Frage nach der Haushaltsproduktion nachgegangen. Sind die technologischen und praktischen Voraussetzungen in jedem Haushalt des nordeuropäischen Neolithikums und der Bronzezeit vorhanden, um Keramik zu produzieren? Oder handelt es sich vielmehr um spezialisierte Gruppen, die Keramik herstellen, sogenannten „Werkstattkreisen", wie sie für die Metallproduktion ganz selbstverständlich angenommen werden? Während der Artikel letzteres Szenario für plausibler hält, zeigen die Experimente, dass der Zeitaufwand zwischen neolithischen und bronzezeitlichen Gefäßen gleichbleibt.*

INTRODUCTION

Besides flint, ceramics are the most frequent material category in excavations since the Neolithic and therefore one of the most important sources for chronological observations, distribution patterns and exchange relationships (Knopf 2009). A comparison of ceramic development in North and northern Central Europe from the Neolithic to the Bronze Age reveals not only different shapes, but also different production techniques and surface treatments. Neolithic pottery, for example, is often richly and extensively decorated, with relatively thin walls and coarsely smoothed surfaces. The pottery of the older Nordic Bronze Age, in contrast, is so coarse and misshapen that it is commonly referred to as '*Kümmerkeramik*' (Deiters 2008, 50; Fokkens 2009, 85). Early Bronze Age pottery from the Únětice groups, in comparison, is also thin-walled and sparsely decorated but shows surface smoothing and slip coating (Kneisel and Schilz 2004). It was not until the later Bronze Age that better crafted vessels were produced, whose carefully smoothed surfaces, however, were partially burnished, had little decoration and were consistently thicker-walled than the Neolithic or Early Bronze Age vessels. The end of the richly decorated surfaces at the beginning of the Nordic Bronze Age is usually explained by the introduction of bronze technology and the change in the decorative medium from pottery to the now richly decorated bronze finds. This raises the question of the actual amount of labour involved in ceramic production. Are the richly decorated vessels of the Neolithic really more time-consuming than the undecorated and smoothed forms of the later Bronze Age?

In contrast to metalworking, prehistoric pottery production is usually seen as household production, which was generally carried out by women (*e.g.* Figuier 1870, 301 fig. 165; Röder 2009; Vincent and Cootes 2012; see also Kelly and Ardren 2016). However, it is often forgotten that household production does not mean pottery-making housewives who produce exclusively for their own use (Röder 2009), but a production of pottery in the domestic environment, which also includes tasks other than vessel production. This is known from many ethnographic descriptions (Stößel 1984; Herbich and Dietler 1991; Lüdtke and Vossen 1991a). This raises the question not only of who were the producers (man – woman – child – family – old – young), but also where the actual production took place — either in each household or exclusively in local production centres, which might possess the 'know how' for the entire *chaîne opératoire* of pottery production.

This article deals with a comparison of different decoration techniques and working processes between Neolithic and Bronze Age pottery in Northern Germany. The pottery of the Funnel Beaker Culture is compared with Bronze Age vessels. This is preceded by two working hypotheses. Firstly, the production of Neolithic vessels requires more labour than that of Bronze Age vessels. Secondly, experienced potters are necessary for the production of the vessels. These hypotheses will be investigated by means of experiments and ethnographic comparisons.

The experiments on which this article is based are less concerned with calculating real working times but rather with illustrating the relative time required for the working processes between Funnel Beaker pottery and Bronze Age pottery, on the one hand, and different vessels from a familiar type (which were repeatedly made) and unknown types (which were never made before) on the other. The present experiments serve above all to illustrate the time difference between the construction of a vessel, decoration, various decoration techniques and the production of new (unfamiliar) vessel types. The experiments are based on decades of the author's practical experience with pottery and the production of some pottery from the Funnel Beaker period. The understanding of Bronze Age shapes is conveyed through her own research focus.

METHOD

To compare different techniques, various vessels from Wangels (Fig. 1), site LA 69 in the district of Ostholstein and one each from the Danish sites of Mogenstrup, East Jutland, Skarpsalling and Hagebrogård in North Jutland were remade. All finds originate from megalithic graves (Brozio 2016; Müller 1918). While the finds from Wangels could be examined in original, the Danish vessels are only known from illustrations in the literature. The Bronze Age vessel was freely modelled. A total of thirteen vessels of different sizes, types and decoration were produced. Some were made twice in order to test different clays (Table 1). The individual work steps were meticulously documented, and the time required for their performance was measured. The detailed protocols are available as a supplement at: https://doi.org/10.57892/100-313.

Ready-to-use clay was used in two variants of temper: on the one hand, a brown-black clay with a temper of 40 %, 0–1.5 mm grog with a firing range between 1000–1260 °C and, on the other hand, a red clay with a temper of 25 %, 0–2 mm grog with a firing range between 1000–1250 °C. The clay weight of the vessels was

Fig. 1. The original Globular amphora and Schultertassen *from Wangels, Schleswig-Holstein (**right**) and **left** the test vessels from the top no. 7, 4, 3 (Photos: Sara Jagiolla).*

weighed at different stages of the production process. Modelling tools of wood and a hardwood paddle were used. The degree of wear and traces of use on the modelling tools were documented using a digital microscope. In addition, cockleshells from the beach were used for decoration and quartz pebbles as burnishing stones. Newspaper served as underlay and a sand-filled textile bag was used for the round bases. Firing took place in an electric kiln at 910 °C. The raw material extraction and clay preparation steps were omitted, as was the subsequent open pit firing. These are described several times in ethnographic and technical studies (*e.g.* Stößel 1984, 59; Rice 1987 172–177; von Dassow 2010; Cuomo di Caprio 2017; Gibson and Woods 1990; Bjørn 1968; Bauer *et al.* 1994; Lucke 1991). Funnel Beaker vessels from Wangels and Bronze Age vessels were frequently reproduced in the past and can be used as reference material, so that sufficient experience in shaping these vessels is available. The globular amphorae pots and the sharply profiled vessel from Hagebrogård in North Jutland, in contrast, were new and unfamiliar forms, which were reproduced for the first time. This difference between known and unknown forms is also reflected in the time required.

Table 1. Overview of the different vessel types and used clays.

Vessel test no.	Origin	Literature	Colour	Clay type	Vessel Type
Test 1	1 Ge 1, Wangels LA 69, Kr. Ostholstein	Brozio 2016, 454 plate 170	Brown-black	PRNM, temper 40 %, 0–1,5 mm grog	*Schultertasse*
Test 2	1 Ge 1, Wangels LA 69, Kr. Ostholstein	Brozio 2016, 454 plate 170	Brown-black	PRNM, temper 40 %, 0–1,5 mm grog	*Schultertasse*
Test 3	1 Ge 2, Wangels LA 69, Kr. Ostholstein	Brozio 2016, 456–57 plate 172–173	Brown-black	PRNM, temper 40 %, 0–1,5 mm grog	*Schultertasse*
Test 4	Shape: 1 Ge 2; ornament: 1Ge3, Wangels LA 69, Kr. Ostholstein	Brozio 2016, 454, 458–59 plate 170, 174–75	Brown-black	PRNM, temper 40 %, 0–1,5 mm grog	*Schultertasse*
Test 5	Hagebrogård, North Jutland	Müller 1918, 30 no. 103	Brown-black	PRNM, temper 40 %, 0–1,5 mm grog	*Schultertasse*
Test 6	1 Ge 29 Wangels LA 69, Kr. Ostholstein	Brozio 2016, 476–77 plate 192–193	Brown-black	PRNM, temper 40 %, 0–1,5 mm grog	Globular amphorae
Test 7	1 Ge 8, Wangels LA 69, Kr. Ostholstein	Brozio 2016, 475 plate 191	Brown-black	PRNM, temper 40 %, 0–1,5 mm grog	Globular amphorae
Test 8	Free style Late Bronze Age/ Early Iron Age vessel	-	Brown-black	PRNM, temper 40 %, 0–1,5 mm grog	Cylindrical neck vessel
Test 9	Different '*Kragenflaschen*'	Jensen 2012	Brown-black	PRNM, temper 40 %, 0–1,5 mm grog	*Kragenhalsflasche*/ collared flask
Test 10	Skarpsalling, Denmark	Nationalmuseets Samlinger Online, Skarpsallingkarret	Red	Vingerling K133, Sibelco, temper 25 % 0–2 mm grog	Skarpsalling vessel
Test 11	Mogenstrup, East Jutland	Müller 1918, 33 no. 120	Red	Vingerling K133, Sibelco, temper 25 % 0–2 mm grog	Drum
Test 12	1 Ge 2, Wangels LA 69, Kr. Ostholstein	Brozio 2016, 456–457 plate 172–173	Red	Vingerling K133, Sibelco, temper 25 % 0–2 mm grog	*Schultertasse*
Test 13	Rheine-Schotthock, Westfalen	Eckert 1986, 402–405 fig. 135	Red	Vingerling K133, Sibelco, temper 25 % 0–2 mm grog	*Fußchenschale*/ Bowl with feet

CERAMIC PRODUCTION TECHNIQUES

For the experiments presented here, the same handbuilding technique was used for both the Neolithic and the Bronze Age vessels (schematic representation of the techniques in Jeffra 2019, fig. 2). In principle, different handbuilding techniques can be used for the same vessel type (Jacobs 2020; Mayor 2010). Experiments at the Saxony-Anhalt Landesamt für Denkmalpflege show a technique for bipartite vessels consisting of two combined pinch pots (*Daumenschale*), one each for the upper and lower parts, but the slab technique could also be considered in addition to the coiling technique. Sometimes the slab and coiling technique can be seen on the broken edges of the vessels (Pierret 2022, 179–253 fig. 2.13; Ross and Fowler 2021). However, other techniques have also been documented, such as moulding or working into a mould (Loman 2013; Mayor 2010). For the Bronze Age site of Bruszczewo, both slab and coiling techniques are documented, with the coils being by far the most common. For the Zug-Sumpf settlement in Switzerland, the authors Irmgard Bauer *et al.* (1994) assume a developed technique for the coil connections in the Late Bronze Age, which was partly achieved by scratching the coils in forehand (better connection), which contrasts with the simple joint coils of Neolithic vessels of the pile-dwelling settlements in Switzerland (Bauer *et al.* 1994). The pinch pot is sufficient for smaller vessels, bowls and cups. But here, too, skill is required to achieve the desired shape and wall thickness, especially if the wall direction changes. A mixture of different techniques is also possible and occasionally documented in prehistoric pottery. Mixed techniques are also the rule rather than the exception in ethnographic studies (*e.g.* Herbich and Dietler 1991, 123; Roux 2019, 3).

A mixed technique was used to construct the test vessels, consisting of a pinch pot for the base and a coil technique for the walls. For the two globular amphorae (test 6–7), a moulded underlay was used to support the round base. For this purpose, a swale was pressed into a sand-filled textile bag and the base of the vessel

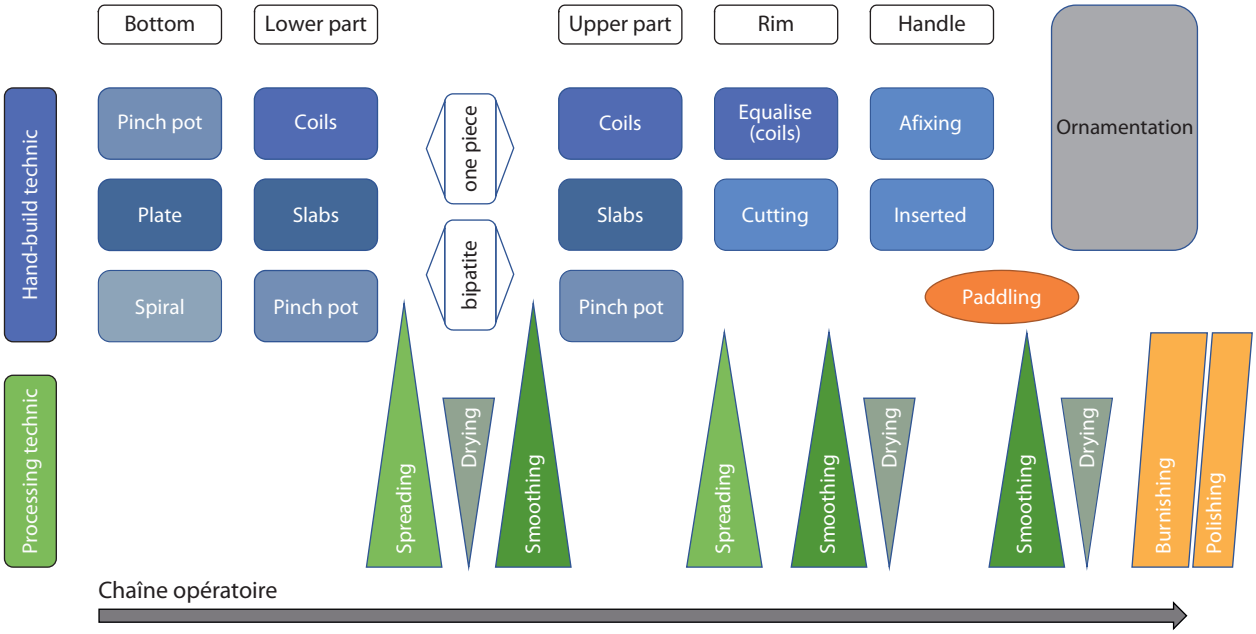

Fig. 2. Chaîne opératoire *for the hand-built ceramics used during the experiment.*

was moulded into it. As the original vessel has a very thin base, this is a plausible approach. With the exception of the neck, the collared flask (*Kragenflasche*, test 9) was made entirely from a pinch bowl and then paddled into shape. The long neck was moulded over a finger. The drum (test 11) was made from two pieces using the coiling technique.

For the *chaîne opératoire* of hand-built ceramics, various overviews of the work processes in vessel production are available (*e.g.* Roux 2016, 105 fig. 8.1; Ernst and Hofman 2019, 128 fig. 6.2; Mayor 2010, 11 fig. 2; Roux 2019, 54–93). However, practice shows that the work process of handbuilding is not quite as linear as shown in the various schematic diagrams. Between the individual sections, the vessel needs time to dry (depending on the environmental temperature and humidity) so that the wall becomes firm enough to support the rest of the walls. During this time, other things can be done or another vessel can be started. The latter is useful for a larger production, the former allows breaks for other activities (Dietler and Herbich 1989; 1991, 128; Stößel 1984; Engelbrecht 1991, 184; Köhler 2017, 200). It often makes sense to smooth the lower part before it dries out too much, during which time it continues to dry and can then be built up further. The edge then only needs to be moistened and scratched to achieve a stable bond between the clay coils (Bauer *et al.* 1994). The *chaîne opératoire* of vessel production is therefore repeatedly interrupted by periods of drying and smoothing (Fig. 2). Ultimately, each potter has their own approach, which can also vary greatly within a community (Dietler and Herbich 1989, 123; Roux 2019, 3).

The rich Funnel Beaker decoration can be achieved with simple tools. All that is needed is a triangular pointed modelling tool and a shell. A burnishing stone was also used to smooth the already leather-hard pottery. An elder stick (hollow inside) was carved into shape for the triangular impressions of the vessel from Scarpsalling, which functions in a similar way to the bird bone originally used. The decorations were all pressed into the mostly still moist clay. Depending on the degree of drying, considerable pressure was required. The vessels from Wrangels are very thin-walled and the decoration on the inside is clearly pushed through the walls, which indicates a moist working state. In addition, the *Furchenstich* (incised-punctated decoration) method is the only way to draw straight lines in coarse-tempered clay, as otherwise the tool would always be deflected by the coarse grains (see also Bauer *et al.* 1994, 135). This can be clearly seen on the drum from Mogenstrup, East Jutland (Müller 1918, 33 no 120). The diamonds on the walls are drawn relatively crooked, as the lines were deflected by the grains of the temper when the incised line was drawn. The cross-hatching of the diamonds, on the other hand, is only scratched flat into the surface and therefore straighter. Due to the smoothing process, most of the temper lies deeper in the vessel wall; the cross-hatching therefore only scratches into the surface layer, where only a few and small pieces of grains lie.

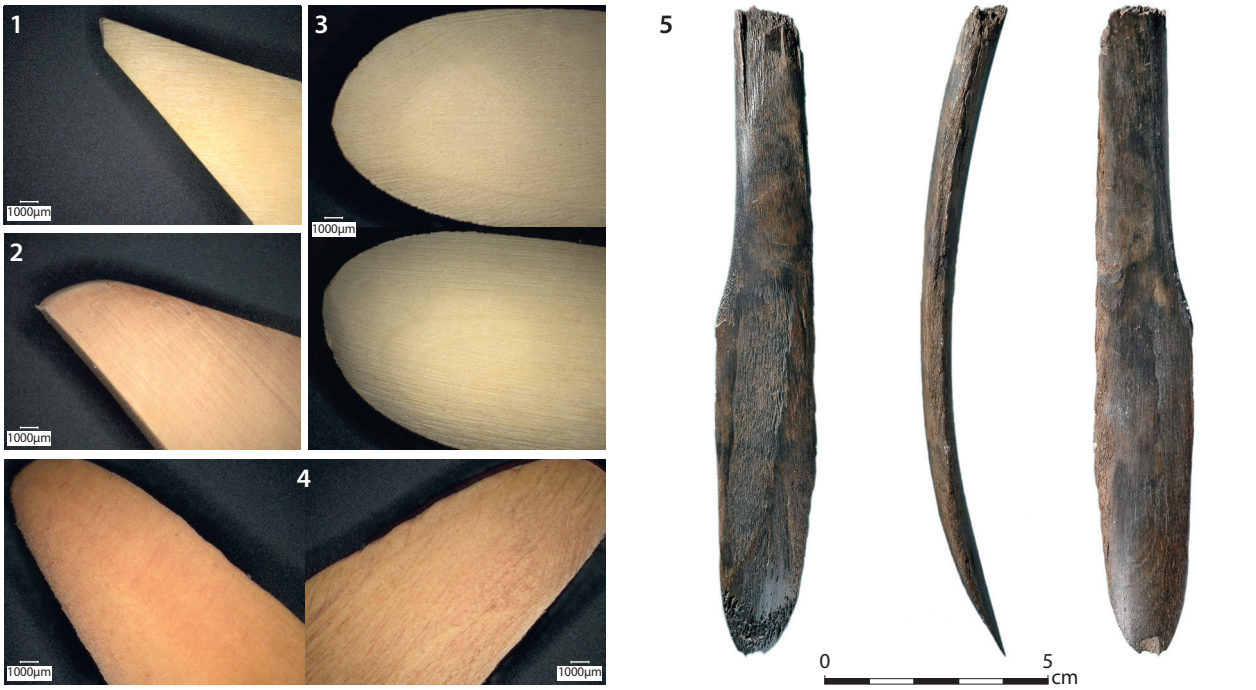

Fig. 3. The use wear and scratch marks caused by the temper grains on the modelling tools. ***1*** *Modelling tool no. 24 in unused condition,* ***2*** *Modelling tool no. 24 after finishing the last vessel, used for ornamentation,* ***3*** *Modelling tool no. 12, front and back side in unused condition,* ***4*** *Modelling tool no. 12, front and back side after finishing the last vessel, used for smoothing the surface and connecting the coils,* ***5*** *A possible bone modelling tool (rib of a cattle) from the Bronze Age Bruszczewo site, Poland (Photos:* ***1–4*** *Jutta Kneisel,* ***5*** *Agnes Heitmann).*

For the incised decoration on the Bronze Age vessel, the wooden point wore off quickly as the clay was already drier. Presumably a very pointed tool, possibly made of flint or a bronze graver, was originally used (see also Bauer *et al.* 1994).

Only three of the commercially available modelling tools were used:

1. a rounded one for joining and smoothing the pottery. This tool wore off considerably during the experiments – the coarser the clay, the faster they wore out (Fig. 3.3–4),
2. a triangular point for the zigzag decorations, the *Furchenstich* (incised-punctated decoration) and the flat triangles, which also rounded off considerably simply by being pressed into the clay (Fig. 3.1–2), and
3. a wooden point for decorating the Bronze Age vessel.

Cockleshells were also used, although these are only useful in relatively moist clay as they break easily. The two burnishing stones used, in comparison, showed no macroscopically recognisable signs of wear. It is known from European potters (Notini 1987, 97) that they often used their burnishing stones for their entire working lives, while wooden tools were obviously a consumable item. Apart from smoothing stones, hardly any tools have survived from prehistoric contexts. A spatula-like tool from a cattle rib in Bruszczewo may have been used to smooth the pottery (Fig. 3.5).

A so-called "wooden paddle" was also used for shaping. Light beating with the paddle on the already somewhat dried clay (not yet leather-hard) compacts the surface and allows a potter to correct or accentuate the shape. In this way, the sagged vessel of test 1 could be paddled halfway back into shape (see supplement). The edge of the Hagebrogård vessel in North Jutland (Müller 1918, 30 no. 103) could also be worked out more clearly. If this was used intensively, the paddle marks can be seen on the inside of the vessels as dents (Bauer *et al.* 1994, 135; Martineau 2006, fig. 4) or a squashed surface, as the shape generally no longer allows the inside to be smoothed after paddling. However, compressed surfaces can also be observed on the bottom of the vessel if they have been paddled and not smoothed afterwards (Roux 2019, 171–173 fig. 3.32–34).

RESULTS

The results of the labour expenditure measurements were surprising. Of course, the amount of labour required varies according to the size of the vessel. However, there are hardly any differences between globular amphorae, *Schultertasse* or Bronze Age vessels (Fig. 4).

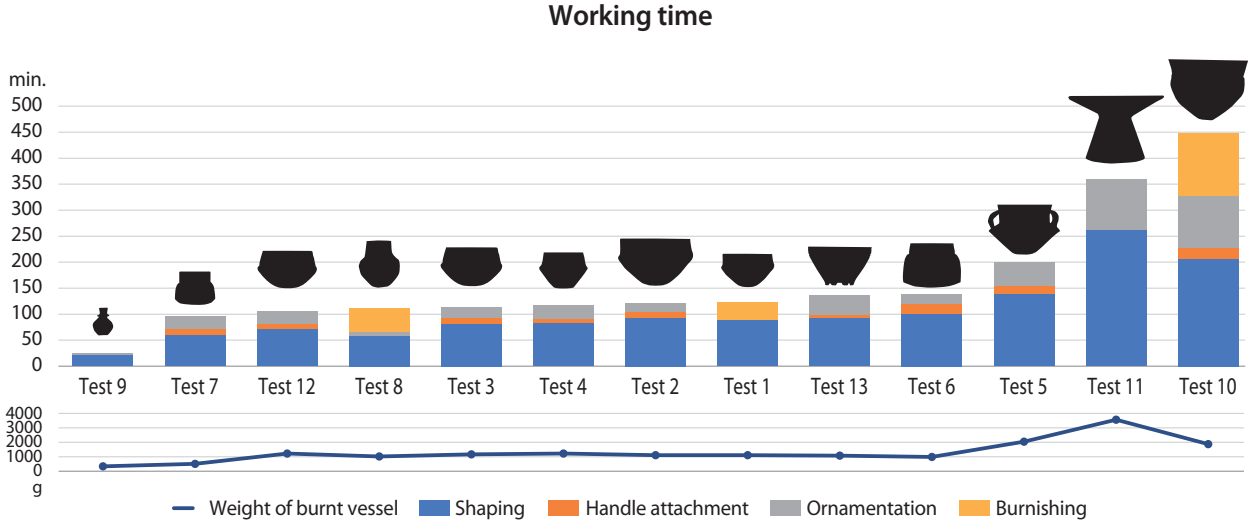

Fig. 4. Labour expenditure in minutes for the thirteen different vessels in the experiment. The weight curve provides an estimation of the amount of clay used for the vessel production.

It took just under two hours to make the cups from Wangels, including decoration, with the decoration taking about 1/5 of the total time and the handle 1/4 of the total time (test 1–4, 12). For test 12, a different clay was used, which was already drier and enabled a faster hand-building. The unusual production of a globular amphora and its decoration took only slightly longer (test 6). The somewhat larger and more richly decorated vessel from Hagebrogård in North Jutland (test 5) took a little longer. The same applies to the drum from Mogenstrup, East Jutland, and the vessel from Skarpsalling — the former because of its two-part design, the latter because of the elaborate burnishing and very complex ornamentation. Looking at the percentage of the total working time used for decoration (Fig. 5), the Bronze Age decoration (incised decoration) takes the least time,

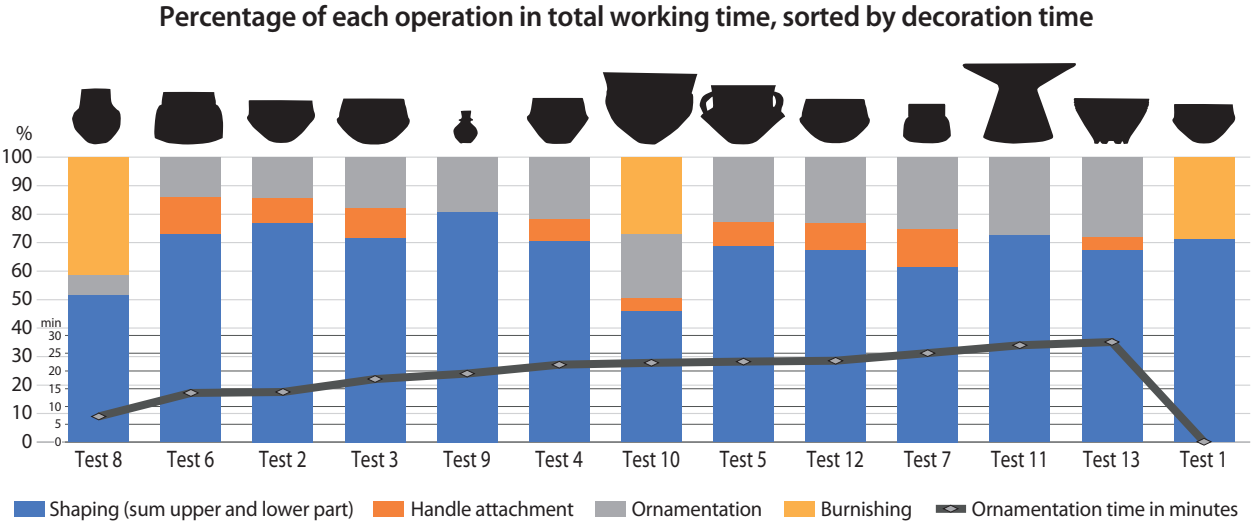

Fig. 5. Percentage comparison of hand-building, decoration, burnishing and handle garnishing in the total production time. Sorted by decoration time in minutes from right to left.

ranging from 7 % for the Bronze Age vessel (test 8) to 27 % and 28 % for the drum (test 11) and footed bowl (*Füßchenschale*, test 13). Burnishing, on the other hand, is the most time-consuming process. Depending on the desired degree of gloss, long and repeated burnishing is required, sometimes interrupted by making the vessel wet again (von Dassow 2010; see also Roux 2019 96, 201; Jacobs 2020, 54). In addition, burnishing becomes more difficult if the vessel is multi-sectioned, as the stone has to be repositioned more frequently. Burnishing took the longest for the vessel from Skarpsalling, partly due to its shape, which has a larger surface compared to the Bronze Age vessel. However, the burnishing and polishing of the Bronze Age vessel took the most time in terms of percentage.[1] The first hypothesis can therefore be rejected. There is hardly any difference in the amount of labour required to produce a vessel, be it from the Bronze Age or the Neolithic. The only difference is in the realisation, surface treatment and decoration. In other words, the change from Neolithic to Bronze Age ceramic production is not due to decreased appreciation for pottery or the effort involved in its production, but to the perception of the vessel its surface and its robustness.

DISCUSSION – LABOUR EXPENDITURE FOR CERAMICS

There are only a few publications on labour expenditure concerning ceramics (Schneider 1991, 73–76; Gruner 1991; Vossen 1991; Bauer *et al.* 1994; Kerig 2015; Cuomo di Caprio 2017, 184). Often only the processes are described without further time specifications (*e.g.* Stern 1951; Lüdtke and Vossen 1991b, 13–18; Bauer *et al.* 1994; Weiss 1994; Köhler 2017) or the focus is on firing (*e.g.* Schneider 1991, 80; Gosselain 1992) or the rotation wheel (*e.g.* Thér and Toms 2016).

Too many uncertainties, from the technique to the ritual actions necessary for the successful vessel, accompany the working process (see Stößel 1984, 69–70; Schneider 1986; Rice 1987, 124). A vessel that is worked on for several days must be covered in between. If it becomes too dry, it needs to be re-wetted, which also involves more work steps than if the vessel is hand-built in one piece. The use of a slowly rotating potter's wheel or *tournettes*, as an equivalent, a curved shard or wooden plate and the working position also have an influence on the working time. Working at a fixed workstation in a seated position requires constant turning of the vessel, while standing allows one to walk around the vessel (Schneider 1991, 73; Köhler 2017, 197). Finally, the organisation of working time also has an impact on production time. Among the Luo in Kenya, potters organise their working hours very differently, depending on availability (Herbich and Dietler 1991, 128) or the number of employees, as is the case with the Patamban in Mexico (Engelbrecht 1991, 184).

In addition, experience and practice in making a particular shape play a major role (see also Bauer *et al.* 1994, 139). Ethnographic analogies with the Kisi on Lake Malawi, for example, show that even small children learn through observation and are able to make simple vessels at about the age of ten. Arnulf Stößel describes that this is followed by a further 3–6 years of practice until the vessels are suitable for sale. The potters only acquire the skills for complex vessel shapes at a mature age (Stößel 1984, 68). Arnulf Stößel also reports a division of labour among the Shai in Ghana, in which experienced female potters carry out the final finishing of the rim and burnishing, while the preparation of the clay is done by teenage girls and the hand-building of the vessels by younger women (*ibid.*). Physique and patience also have an effect on the labour time. Heavy vessels are more complex to work on and require more strength and, depending on the care and patience required, working processes and decorations can take longer (Bollinger Schreyer 2009). These are just a few of many possible examples that illustrate how different the process of vessel making can be.

In various practical courses at Kiel University with students, trained potters, and hobby ceramists from the Volkshochschule Kiel, it was shown that the production of small vessels can be learnt within 1–3 days by reasonably skilful hands under supervision, even if the specified shape (type) is often not achieved. Untrained archaeologists and skilled potters found it easier to make the right shape than non-archaeologists, who had experience with clay but no sense or experience for shape and decoration. In terms of speed, trained potters were the fastest, followed by people with general experience in hand-built vessels. However, this only applies to making vessels with clay that has already been prepared. The search for the right clay sources, the preparation of the clay, the correct temper and kneading, as well as the subsequent firing, in contrast, are processes that require a lot of experience and practice and cannot simply be learnt and/or passed on from one day to the next (Lüdtke and Vossen 1991a;

1 Although it has a Neolithic shape, test 1 was not decorated, but was polished instead.

Bauer *et al.* 1994). For example, it took several pit fires to learn how to handle the firing process correctly and to achieve an error rate of less than 25 %, which is still very high. For comparison: the first pit fire had an error rate of 80 %. In addition, poorly crafted ceramics with irregular wall thicknesses have a lower chance of survival in pit firing, whereas this is generally not a problem in modern electric kilns.

The labour expenditure mentioned in the literature for ethnographic observations on pottery production vary greatly and depend on the factors mentioned above. Among the Malinke in Côte d'Ivoire, large vessels (of 25 litre volume) are built up in series of about ten pieces in four hours on a slowly rotating potter's wheel. Only then is further processing carried out with smoothing and scratching of the vessel wall, decoration and burnishing. In total, the production of the ten vessels takes one day (Gruner 1991, 97). The activity is carried out seasonally by women all day and is limited to individual villages (*ibid.*, 93). Among the Luo in Kenya, ceramics are also produced seasonally by women. Ceramics are used for exchange and trade and are a specialised craft that is carried out as a part-time job (Herbich and Dietler 1991, 107). The working hours vary depending on the size, practitioner and care. For smaller vessels, an average of 30 minutes is estimated, for medium-sized vessels 105–140 minutes plus a further hour for the application of ochre and burnishing. In times when there is no other work apart from the usual household chores, potters can produce two large or six small pots a day, but rarely more than 20 pots per week (*ibid.*, 128). There is a comparative study from Morocco for several pottery centres. In Slit, a regional production centre in Morocco, pottery is made by women as a sideline. Among the 60 houses in Slit, there were 40 women potters, in the neighbouring villages there were only 2–6 women who made pottery regularly (Vossen 1991, 137–138). This contrasts with the pottery villages around Ait Hamed, where pottery is a full-time occupation for men, and Ifrane Ali, where pottery is a full-time job for women. Two large water jugs can be made per afternoon in Slit, *i.e.* twelve in a week over six days. The seventh day is then used for decoration. According to Rüdiger Vossen, however, production is usually lower, as material procurement and clay preparation are also involved. The situation is different in Ifrane Ali, where 60–80 vessels are produced per week (*ibid.*, 143).

Among the Lobi in Bukina Faso, women also practise making specialised pottery. According to Klaus Schneider, a medium-sized vessel takes 21 minutes to make, including burnishing and decorating (without a 35-minute drying break), which is quite fast for a vessel of this size. The coils were already made beforehand and do not count as part of the calculated labour time (Schneider 1991, 76).

In the experiment described here, three to four vessels could be produced in an eight-hour working day (with breaks for preparation, cleaning up and lunch-break) (test vessel 2–4 and test 6–9). Test 10–11 required 1 ½ working days (see suppl.). Compared to the labour expenditure described above and the much larger vessels, this is quite long. This is not only due to the fact that it was necessary to adhere to the original design during the experiment, but also to a lack of intensive or regular practice in making these shapes. When producing the same form over and over again, the hand movements become automated, which allows for faster work (Ingold 2013, 64-65; Heitz 2017a, 268–269). Looking at the increase in the quantities of clay processed for test vessels 2–4, 12 with the same shape, and with a simultaneous slight decrease in the working times for the vessel body and the handles, a slight practice effect can also be observed in the experiments carried out here (see Figs. 4–5).

The ethnographic examples and experiments listed here show that although vessel production can take place on the basis of 'non-specialised household production', the technological know-how or embodied knowledge and expert knowledge must be available (Melko 2017, 216-217). Different working styles can also be identified from European prehistory. For the Late Bronze Age settlement of Zug-Sumpf, Switzerland, the authors were able to identify house styles that initially speak in favour of in-house production (Bollinger Schreyer 2009, 78). In addition, different 'handwritings' in the design of the decoration could be identified, which point to several people with different skills on site, but some of the decorations also found further distribution (*ibid.*, 80, 85–86; Heitz 2017a, 262 fig. 3). Caroline Heitz points out for the same period and region that pottery may well have been produced in series (*ibid.*, 285), which would suggest a specialised or semi-specialised production that may not have been carried out in every place and household. Accordingly, both in-house production in the household and specialised production, which is more widespread, were possible. New analyses of burial and settlement ceramics from the Lusatian groups in Brandenburg show that the bowls were produced specifically for burial use and had poorer qualities than the settlement pottery, *i.e.* they were made specifically for non-use in the graves (Beilke-Voigt 2019). In addition, the quantity and quality of the Lusatian ceramics, the fine burnished surfaces and carefully performed decorations indicate a semi-professional and specialised pottery production. Robert Hofmann recently discussed the specialisation of pottery production in Okolište in Central Bosnia for the Neolithic (Hofmann 2023). Indicators such as increasing numbers of pieces, advanced firing techniques and metric standardisation may point to increasing specialisation (*ibid.*, 122). For Okolište, he

argues for part-time specialisation, as we know it from the ethnographic studies mentioned above, whereas a higher level of craft specialisation is plausible for the Vinča communities. But in both cases, production is limited to some specialised households.

The demand for pottery and the lifespan of each vessel are also important factors in the understanding of production. Although the use of ceramic vessels varies greatly from region to region and depends on preferences, food preparation and storage, ethnographic studies show that the need for vessels per year can be quite high. The ethnographic sources often describe the actual inventory of a household (census) and the life span of the vessels (Rice 1987, 296 table 9.4; Varien and Mills 1997, 146). There is a difference between the lifespan of the vessels as described by Prudence Rice and other ethnographers (David 1972, 141 table 1; Frankel and Webb 2001, 125 table 9; Tani and Longracre 1999, 306 table 2; Shott 2022, 805 table 3) and the annual replacement required (Schneider 1991, 85). The calculations here are very different (Varien and Mills 1997, 149 table 1; Shott 2022). In general, however, small vessels and heavily used vessels such as cooking vessels have a high throughput (Varien and Mills 1997, 153 fig. 2), while storage vessels often last longer (David 1972, 141; Rice 1987, 298). Klaus Schneider assumes an annual loss of 27–36 vessels for the Lobi, which mainly concerns the cooking vessels for millet porridge and sauces (Schneider 1991, 85). Nicolas David calculates the lifespan of vessels for the Fulani in Cameroon. Bowls and small to medium-sized cooking vessels have an average lifespan of 2.5–2.7 years, while storage vessels can last up to ten years (David 1972, 141).

Even if we certainly have to reckon with pottery production for personal use in certain regions and at certain times, as seems to be the case, for example, for the older Bronze Age in Northern Germany with the so-called *'Kümmerkeramik'*, which only reveals rudimentary skills or requirements for pottery production, the investigations presented here confirm the second hypothesis. Ceramics are not produced by just anyone, but by specialists who have the technical expertise for the entire production chain. It does not have to be a matter of individuals, but production can be based on a division of labour within a group or family, *i.e.* vessel construction and decoration, for example, are carried out by different people. Serial production from Zug-Sumpf or groups of similar forms, as in Wangels (Brozio 2016, 139), also point to specific individuals with experience and specialisation. Especially for carefully crafted vessels, such as the example from Skarpsalling, a higher level of technological knowledge is necessary. The ethnographic examples demonstrate a division of labour in pottery production that is limited to a few villages or a specific region, which then exchange or trade the produced ceramics. The case study of Okolište came to the same result (Hofmann 2023). In the Danish Neolithic, for example, specialisation and a structured, sometimes large-scale production of more or less elaborate objects (such as axes, daggers) is assumed for flint knapping and axe production (oral communication Berit V. Eriksen; Hinrichs 2024) and the metal caster in the Bronze Age is also understood as an expert (Wrobel Nørgaard 2017). In the same sense, ceramic production must also be understood as a specialised craft that was not practised by everyone.

SUMMARY

Based on ceramic experiments and ethnographic observations, this article compares the labour expenditure required to produce Neolithic and Bronze Age pottery and examines the question of household production or specialisation. While specialisation is assumed in the literature for individual flint and stone artefact types and for bronze technology in general, prehistoric pottery is traditionally understood more as household production that 'anyone' can make. Experience with various experiments, a case study and ethnographic studies prove the opposite. The entire process of pottery production is complex and requires years of experience. The technological knowledge of clay deposits, tempering, hand-building and firing requires a long learning process and transfer of knowledge to produce functional vessels.

The presented experiments on the expenditure of labour between richly decorated Funnel Beaker pottery and less decorated Bronze Age pottery only represent a relative comparison of working times. Since one and the same ceramic form can be produced using very different techniques and work processes, it is hardly possible to reflect the actual amount of work involved. This is also demonstrated by the ethnographic examples, which show very different and, in some cases, considerably shorter working times for larger vessels. Nevertheless, the results were surprising, as the relative comparison showed little difference in the amount of work involved. In the Bronze Age, smoothing and burnishing replaced the rich decoration of the Neolithic in Northern and North Central Europe, both requiring roughly the same amount of time. The assumed loss of value of ceramics in favour of metal in the Bronze Age, which is associated with sparser decoration and thus less work, is not correct. The careful surface treatment of Bronze Age vessels is just as time-consuming as the

extensive Neolithic decorations. The change in the production of ceramics from the Neolithic to the Bronze Age therefore takes place in the perception of the surfaces and not in the amount of labour invested.

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REFERENCES

Bauer, I., Bollinger, S. and Weiss, J., 1994. Experimentelle Archäologie. Die Herstellung von spätbronzezeitlicher Keramik. *Tugium* 10, 129–140.

Beilke-Voigt, I., 2019. Töpfe für Lebende und für Tote. Archäometrische Untersuchungen zur Turbanrandkeramik in Brandenburg. *Archäologie in Berlin und Brandenburg* 2017, 47–51.

Bjørn, A., 1968. *Exploring fire and clay. Man, fire, and clay through the ages*. New York: Van Nostrand-Reinhold.

Bollinger Schreyer, S., 2009. Die Handschrift der Töpferin. Untersuchungen zur spätbronzezeitlichen Keramik von Zug-Sumpf (Schweiz). *In: Stockhammer 2009*, 77–88.

Brozio, J.P., 2016. *Megalithanlagen und Siedlungsmuster im trichterbecherzeitlichen Ostholstein*, Frühe Monumentalität und Soziale Differenzierung 9. Bonn: Habelt.

Cuomo Di Caprio, N., 2017. *Ceramics in Archaeology. From Prehistoric to Medieval times in Europe and the Mediterranean: Ancient Craftsmanship and Modern Laboratory Techniques*. Roma: L'Erma di Bretschneider.

David, N., 1972. On the Life Span of Pottery, Type Frequencies, and Archaeological Inference. *American Antiquity* 37, 141–142.

Deiters, S., 2008. Was passierte wann? Einführung in die frühe, mittlere und späte Bronzezeit. *In:* J.M.R. Bélanger and C. Grünewald, eds. *Westfalen in der Bronzezeit*. Münster: LWL Archäologie für Westfalen, 46–53.

Dietler, M. and Herbich, I., 1989. Tich Matek. The Technology of Luo Pottery Production and the Definition of Ceramic Style. *World Archaeology* 21, 148–164.

Eckert, J., 1986. Rheine. *Ausgrabungen und Funde in Westfalen-Lippe* 3, 402–405. https://www.altertumskommission.lwl.org/de/forschung/megalithik/das-grosssteingrab-von-rheine-schotthock/ ; last access 14th March 2025

Engelbrecht, B., 1991. Töpferei der Patamban (Michoacan, Mexiko). *In: Lüdtke and Vossen 1991a*, 179–200.

Ernst, M. and Hofman, C.L., 2019. Breaking and Making Identities. Transformations of Ceramic Repertoires in Early Colonial Hispaniola. *In:* C.L. Hofman and F.W.M. Keehnen, eds. *Material Encounters and Indigenous Transformations in the Early Colonial Americas: Archaeological Case Studies*. Leiden: Brill, 124–145.

Figuier, L., 1870. *L'Homme Primitif*. Paris: Librairie Hachette. https://archive.org/details/bub_gb_IPxL-HjFV6MC/page/301/mode/2up ; last access 14th March 2025

Fokkens, H., 2009. Die Wirtschaft der nordischen Bronzezeit. Mehr als Getreide Säen and Vieh züchten. *In:* H. Fokkens, M. Bartelheim and H. Stäuble, eds. *Die Wirtschaft der Nordischen Bronzezeit: mehr als Getreide saen und Vieh zuchten*. Leiden: Universität Leiden, 85–104.

Frankel, D. and Webb, J.M., 2001. Population, Households, and Ceramic Consumption in a Prehistoric Cypriot Village. *Journal of Field Archaeology* 28, 115–129.

Gibson, A. and Woods, A., 1990. *Prehistoric Pottery for the Archaeologist*. London: Leicester University Press.

Gosselain, O.P., 1992. Bonfire of the Enquiries. Pottery Firing Temperatures in Archaeology. What For? *Journal of Archaeological Science* 19, 243–259.

Gruner, D., 1991. Töpferei der Malinke. *In: Lüdtke and Vossen 1991a*, 93–103.

Heitz, C., 2017. Making things, being mobile. Pottery as intertwined histories of humans and materials. *In: C. Heitz and R. Stapfer 2017b*, 257–291.

Heitz, C. and Stapfer, R., eds., 2017b. *Mobility and pottery production. Archaeological and anthropological perspectives*. Leiden: Sidestone Press.

Herbich, I. and Dietler, M., 1991. Aspects of the ceramic system of the Luo of Kenya. *In: Lüdtke and Vossen*, 105–135.

Hinrichs 2024: M. Hinrichs. *Craftful Minds. Tracing Technical Individuality in Production Processes*, Roots Studies 7. Leiden: Sidestone.

Hofmann, R., 2023. Specialization in pottery production: An alternative strategy of structurally undersupplied households? – A case study concerning the late Neolithic settlement of Okolište in Central Bosnia. *Glasnik Zemaljskog Muzeja Bosne i Hercegovine u Sarajevu* 55, 91–128.

Ingold, T., 2013. *Making. Anthropology, archaeology, art and architecture*. Abingdon: Oxon, Routledge.

Jacobs, L., 2020. Experimentally forming Celtic vessels from the Heuneburg and the Mont Lassois. *In:* A. Van Gijn, J. Fries-Knoblach and P. Stockhammer, eds. *Pots and practices. An experimental and microwear approach to Early Iron Age vessel biographies*. Leiden: Sidestone, 25–63.

Jeffra, C., 2019. Crafter. Potting Techniques of the Bronze Age. *EXARC Journal*.

Jensen, J., 2012. *Pottemagerens kunst*, Danmarks Nationalleksikon Online. "Kraveflasker". https://danmarksoldtid.lex.dk/Pottemagerens_kunst ; last access 14th March 2025

Kelly, S.E. and Ardren, T., eds., 2016. *Gendered Labor in Specialized Economies. Archaeological Perspectives on Female and Male Work*. Boulder: University Press of Colorado.

Kerig, T., 2015. *Data for comparing prehistoric and ancient economies: The Cologne Tableau (Kölner Tableau, KöTa)*. https://www.academia.edu/34287790 ; last access 14th March 2025

Kneisel, J. and Schilz, C., 2004. Die Keramik aus dem östlichen Feuchtbodenareal. *In:* J. Czebreszuk and J. Müller, eds. *Bruszczewo. Ausgrabungen und Forschungen in einer prähistorischen Siedlungskammer Großpolens I*. Rahden/Westfalen: Verlag Marie Leidorf, 153–246.

Knopf, T., 2009. Keramik in der Archäologie. Möglichkeiten und Grenzen der Interpretation. *In: Stockhammer 2009*, 1–12.

Köhler, I., 2017. Movement in making. 'Women working with clay' in northern Cote d'Ivoire. *In: C. Heitz and R. Stapfer 2017b*, 189–211.

Loman, V., 2013. Die bronzezeitliche Keramikherstellung in Kasachstan. *In:* T. Stöllner and Z. Samasev, eds. *Unbekanntes Kasachstan. Archäologie im Herzen Asiens. Katalog der Ausstellung des Deutschen Bergbaumuseums Bochum vom 26. Januar–30. Juni 2013,* Veröffentlichungen aus dem Deutschen Bergbau-Museum Bochum 192. Bochum: Deutsches Bergbau-Museum, 307–314.

Lucke, A., 1991. Vergleichende ethno-archäologische Untersuchungen zu Brenntechniken an vier nordmarokkanischen Töpferorten. *In: Lüdtke and Vossen 1991a*, 319–338.

Lüdtke, H. and Vossen, R., eds., 1991a. *Töpfereiforschung – archäologisch, ethnologisch, volkskundlich. Beiträge des internationalen Kolloquiums 1987 in Schleswig.* Bonn: Habelt.

Lüdtke, H. and Vossen, R., eds., 1991b. Vorwort. Einführung in die Themenstellung des Kolloquiums (mit Gliederungsschema für die Deskription der Töpfereiprozesse). *In: Lüdtke and Vossen 1991a*, 7–18.

Martineau, R., 2006. Identification expérimentale des techniques de façonnage des poteries archéologiques *In:* L. Baray, ed. *Artisanats, sociétés et civilisations. Homage à Jean-Paul Thevenot*. Online source: Artehis Éditions. https://doi.org/10.4000/books.artehis.13809

Mayor, A., 2010. Ceramic Traditions and Ethnicity in the Niger Bend, West Africa. *Ethnoarchaeology* 2, 5–48.

Melko, N., 2017. Form follows fingers. Roman pottery, the producer's perspective and the mobility of ideas. *In: C. Heitz and R. Stapfer 2017b*, 213–228.

Müller, S., 1918. *Stenalderens Kunst i Danmark, Oldtidens Kunst i Danmark 1*. København: Reitzel.

Nationalmuseets Samlinger Online, 2025. *Digitale samlinger: Skarpsallingkarret*. https://samlinger.natmus.dk/do/asset/9665 ; last access 14th March 2025

Notini, A., 1987. *Europäische Töpferkunst. Handwerk mit Tradition*. Frankfurt am Main: Umschau Verlag.

Pierret, A., 2022. Du façonnage à la cuisson. *In:* V. Roux and M.-A. Courty, eds. *Des céramiques et des hommes. Décoder les assemblages archéologiques*. Nanterre: Presses universitaires de Paris Nanterre.

Rice, P.M., 1987. *Pottery analysis. A sourcebook*, Chicago: University of Chicago Press.

Röder, B., 2009. Töpfernde Hausfrauen, Vollerwerbstöpfer und Puppengeschirr formende Kinder? Soziale Dimensionen urgeschichtlicher Keramikherstellung. *In: Stockhammer 2009*, 93–116.

Ross, J. and Fowler, K., 2021. Identifying Ceramic Shaping Techniques: Experimental Results Using the Inclusion and Void Orientation Method. *EXARC Journal* 3. https://exarc.net/ark:/88735/10590 ; last access 14th March 2025

Roux, V., 2016. Ceramic Manufacture: The chaîne opératoire Approach. *In:* A.M.W. Hunt, ed. *The Oxford Handbook of Archaeological Ceramic Analysis*. Oxford: Oxford University Press, 101–113.

Roux, V., 2019. *Ceramics and Society. A technological Approach to Archaeological Assemblages*, Cham: Spinger.

Schneider, K., 1986. Sakrale Töpferei der Lobi in Burkina Faso. *Paideuma* 32, 207–238.

Schneider, K., 1991. Töpferei der Lobi. *In: Lüdtke and Vossen 1991a*, 65–91.

Shott, M.J., 2022. Inferring Use-Life Mean and Distribution: A Pottery Ethnoarchaeological Case Study from Michoacán. *American Antiquity* 87, 794–815.

Stern, T., 1951. Pamunkey Pottery Making. *Southern Indian Studies* 3, 1–76.

Stockhammer, P., ed., 2009. *Keramik jenseits von Chronologie. Beiträge der Arbeitsgemeinschaft 'Theorie in der Archäologie' bei der Tagung des West- und Süddeutschen Verbandes für Altertumsforschung e.V. in Xanten, 7.–8. Juni 2006*. Rahden/Westfalen: Verlag Marie Leidorf.

Stößel, A., 1984. Afrikanische Keramik südlich der Sahara. *In:* A. Stößel and B. Fagg, eds. *Afrikanische Keramik. Traditionelle Handwerkskunst südlich der Sahara. Ausstellung: Staatliches Museum für Völkerkunde, München, 12.10.1984–05.12.1985*. München: Hirmer Verlag, 53–157.

Tani, M. and Longracre, W.A., 1999. On Methods of Measuring Ceramic Uselife: A Revision of the Uselife Estimates of Cooking Vessels among the Kalinga, Philippines. *American Antiquity* 64, 299–308.

Thér, R. and Toms, P., 2016. Quantification of the orientation and alignment of aplastic components of a ceramic body as a method for distinguishing among various means of using a rotational device in pottery forming. *Journal of Archaeological Science: Reports* 9, 33–43.

Varien, M.D. and Mills, B.J., 1997. Accumulations Research: Problems and Prospects for Estimating Site Occupation Span. *Journal of Archaeological Method and Theory* 4, 141–191.

Vincent, K. and Cootes, E., 2012. Ceramic Production, Distribution, and Prehistoric Society in the Peak District National Park. PhD Thesis. Sheffield: University of Sheffield. https://www.google.com/url?sa=t&source=web&rct=j&opi=89978449&url=https://www.academia.edu/63093573/CERAMIC_PRODUCTION_DISTRIBUTION_AND_PREHISTORIC_SOCIETY_IN_THE_PEAK_DISTRICT_NATIONAL_PARK&ved=2ahUKEwj77oCYpomMAxX7Q_EDHd1BBukQFnoECB0QAQ&usg=AOvVaw2FufChDz9XlVaiUjTC_XIE ; last access 14th March 2025

von Dassow, S., 2010. *Polierte Oberflächen im Rauchbrand*. Koblenz: Hanusch Verlag.

Vossen, R., 1991. Töpferei in Marokko. *In: Lüdtke and Vossen 1991a*, 137–156.

Weiss, J., 1994. Erfahrungen beim Herstellen und Brennen von prähistorischen Keramikkopien. *Jahrbuch der Schweizerischen Gesellschaft für Ur- und Frühgeschichte* 77, 115–122.

Wrobel Nørgaard, H., 2017. Bronze Age metal workshops in Denmark between 1500–1300 BC. Elite-controlled craft on Zealand. *In:* S. Bergerbrant and A. Wessman, eds. *New Perspectives on the Bronze Age. Proceedings of the 13th Nordic Bronze Age Symposium held in Gothenburg 9th–13th June 2015*. Oxford: Archaeopress, 127–142.

Zeit und Ornament – Eine interdisziplinäre Reflexion

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KEYWORDS: *time expenditure, gift, magic, ornamentation as an accumulator*

Zusammenfassung

Im symbolisch-künstlerischen Feld menschlicher Ausdrucksweisen stellt das Ornament einen speziellen Bereich dar. In unserem Beitrag nähern wir uns der „ornamentalen Dimension", ihren Rollen und ihrer Bedeutung in menschlichen Lebenswelten von zwei unterschiedlichen disziplinären Perspektiven aus an: aus archäologisch-ethnoarchäologischer und aus psychiatriehistorischer Sicht. Reich Ornamentiertes, in der Herstellung sehr Zeitaufwändiges wird im archäologischen Kontext oft als Prestigegut und damit Anzeiger des Status hochstehender Individuen in einer hierarchischen Gesellschaft verstanden. In der Psychiatriegeschichte spielt das Ornament im Bereich der Kunst von Menschen mit psychischen oder geistigen Beeinträchtigungen eine Rolle, dabei wurde Ornamentik im künstlerischen-kreativen Schaffen von Menschen in psychiatrischen Anstalten lange Zeit vor allem als spezifisches pathologisches Symptom und Merkmal von „Irrenkunst" gedeutet. Aus beiden disziplinären Perspektiven zeigt sich, dass der Aspekt von Zeit und Zeitlichkeit und deren Bedeutung für Genese, Form und Rollen von Ornamentik in der Forschung bisher wenig beachtet wurde. Wir werfen daher einen Blick auf den Zusammenhang von Zeit und Ornament aus interdisziplinärer Perspektive, der Erklärungsmöglichkeiten zur sozio-kulturellen, aber auch allgemein lebensweltlichen Einbindung von Ornamentik in den Mittelpunkt stellt. Zunächst stellen wir jeweils kurz die historische Entwicklung in beiden Disziplinen mit Fokus auf das Thema Ornamentik vor, um dann die Verbindung von Ornamentik und Strukturierung von Zeit sowohl durch die archäologisch-ethnoarchäologische als auch durch die psychiatriehistorische Linse genauer zu betrachten. Dabei zeigen sich strukturelle Gemeinsamkeiten zum einen in Bezug auf Zeit als Ressource und zum anderen auf Performativität und die Wirkmächtigkeit von Prozessen. Von Bedeutung scheint vor allem die Funktion des Ornamentalen als Akkumulator zu sein, wonach das Ornament als kreative und oft sozial wirkmächtige Entladung gesammelter Zeit verstanden werden kann.

Abstract

Ornamentation represents a special area in the symbolic-artistic field of human expression. In our paper, we approach the "ornamental dimension", including its roles and its significance in human life-worlds, from two different disciplinary perspectives: from an archaeological-ethnoarchaeological and a psychiatric-historical point of view. In an archaeological context, richly ornamented objects, which are very time-consuming to produce, are often understood as prestige goods and thus as indicators of the status of high-ranking individuals in a hierarchical society. In the history of psychiatry, ornamentation plays a role in the art of people with psychological or mental impairments, and for a long time, ornamentation in the artistic and creative work of people in psychiatric institutions was primarily interpreted as a specific pathological symptom and characteristic of 'art of the insane'. In both disciplines, it is evident that the aspect of time and temporality and their significance for the genesis, form and roles of ornamentation have so far received little attention in research. We therefore take a look at the relationship between time and ornament from our interdisciplinary perspective, focusing on possible explanations of the socio-cultural and general lifeworld integration of ornamentation. First, we briefly present the historical development in both disciplines with a focus on the topic of

ornamentation, in order to then take a closer look at the connection between ornamentation and the structuring of time through both the archaeological-ethnoarchaeological and the psychiatric-historical lens. Structural similarities emerge in relation to time as a resource, on the one hand, and performativity and the effectiveness of processes on the other. The function of ornamentation as an accumulator seems to be of particular importance, according to which the ornament can be understood as a creative and often socially effective discharge of accumulated time.

„Kunst ist eine Erfahrung, nicht ein Objekt."
(Robert Motherwell, 1915–1991)

„'Saving' ornaments from the realms of the aesthetic and superfluous contributes to saving our own dignity and, to some extent, our humanity."
(Vlad Glăveanu 2014)

EINLEITUNG

Symbolische Darstellungen als Ausdrucksform gelten als ein exklusives Merkmal des Menschen, das sich erstmals mit dem frühen Homo Sapiens von Afrika über Europa bis Südostasien in größerem Umfang nachweisen lässt (Álvarez Fernández und Jöris 2008; Bar Yosef und Bosch 2019; Oktaviana *et al.* 2024). Graphische Zeichen, die aufgrund ihrer geographischen Lage und Datierung mit Neandertalern in Verbindung gebracht werden, sind bisher vereinzelt geblieben (Zilhão 2007).

Einen speziellen Bereich im symbolisch-künstlerischen Feld stellt das Ornament dar. Während wohl jeder Mensch eine alltägliche Vorstellung davon hat, was ein Ornament ist (Zierleisten und Teppichmuster mögen hier vor dem geistigen Auge erscheinen), gestaltet sich die Lage aus kunsttheoretischer Perspektive komplexer: Statt einer eindeutigen allgemeingültigen Definition zeigt sich ein vielfältiges, jeweils im historischen Zusammenhang verortetes Spektrum an Formen, Bedeutungen und Funktionen, das den Bogen von der bildenden Kunst über Literatur bis hin zu Musik, Mode und Gartenkunst spannt. Diese „ornamentale Dimension" ist je nach Kontext äußerst divers im Hinblick auf Entstehung und Herstellung, (Im-)Materialität, Ausdruck sowie praktische und transzendente Rollen (Criticos 2004). Eine Grundlinie für ein universales Konzept des Ornaments lässt sich etymologisch aufspannen: *„ornamentum"* als lateinische Übersetzung des griechischen *„κόσμος"* (in der Bedeutung „Ordnung") benennt einen Ankerpunkt und die Weiterentwicklung des Begriffs „Ornament" zur Bedeutung, Ausstattung oder Verschönerung einen anderen (Coosmaraswamy 1977). Der Kulturpsychologe und Kommunikationswissenschaftler Vlad Glăveanu (2014) unterscheidet acht funktionale Felder von Ornamentik, die sich entlang zweier sich überschneidender Kontinuen entfalten, nämlich zwischen ästhetischen und utilitaristischen Funktionen einerseits sowie zwischen individuellen und sozialen/gesellschaftlichen Funktionen andererseits (Abb. 1). Wiederholung und Kombination als häufige Merkmale von Ornamentik sind es, die ein neuntes funktionales Feld eröffnen, die „Meta-Funktion" des Entstehens, der Generierung, des Neuschaffens (Glăveanu 2014).

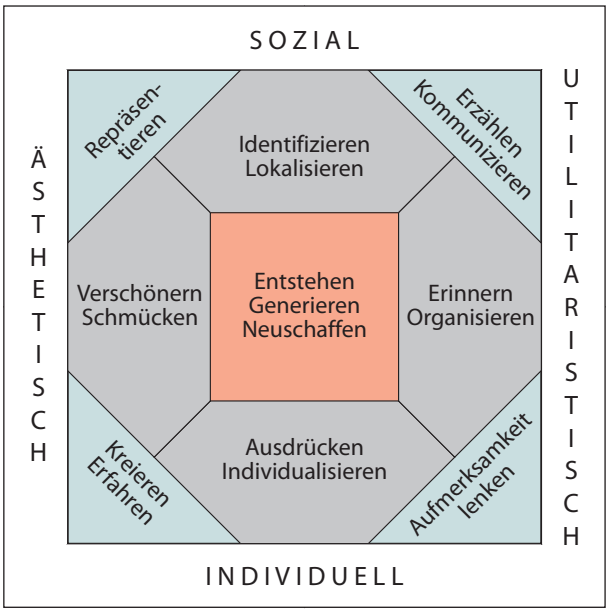

Abb. 1. Die Funktionen von Ornamenten (umgezeichnet und übersetzt nach Glăveanu 2014, 87 Abb. 1).

In unserem Beitrag möchten wir uns dem Ornament und seiner Erstellung und Konstitution, seinen Rollen und seiner Bedeutung in menschlichen Lebenswelten

von zwei unterschiedlichen disziplinären Perspektiven aus annähern, und zwar aus archäologisch-ethnoarchäologischer und aus psychiatriehistorischer Sicht.

In der archäologischen Forschung zu Menschen und ihren Gesellschaften, zu den „Anderen" der Vergangenheit tritt das Ornament in unterschiedlicher Form in Erscheinung, von Symbolen an Höhlenwänden und Mustern an Bauten über Schmuckausstattungen und Kleidungsbesatz in Gräbern bis hin zu Verzierungen an Keramik und anderen Gegenständen. Bedingt durch das Quellenspektrum der Archäologie handelt es sich immer um materielle Spuren; eine Annäherung an Facetten und Varianten der immateriellen Sphäre ist lediglich allgemein über ethnographische und ethnoarchäologische Informationen möglich. Unser Beitrag fokussiert dabei im immensen Spektrum vergangener menschlicher Lebenswelten exemplarisch auf die Ornamentik bei Jäger-Sammler-Gemeinschaften.

In der Psychiatriegeschichte spielt das Ornament im Bereich der Kunst von Menschen mit psychischen oder geistigen Beeinträchtigungen eine Rolle. Im Laufe des 20. Jahrhunderts wurde diese Kunst zunächst als „Bildnerei" bezeichnet und später unter Begriffen wie *„Art brut"*, *„Outsider Art"*, *„Self-taught Art"* rubriziert — diese Debatte hält u. a. mit der Intention der *„Auflösung einer pathologisierenden Perspektive auf diese Werke"* (Gümpel/Röske 2024, 62) an. Im historischen Verlauf der Einordnung und Deutung wurde — insbesondere auch aus der „pathologisierenden Perspektive" — das Ornament als typisches Merkmal dieser Kunst wahrgenommen.

Aus beiden disziplinären Perspektiven zeigt sich, dass ein Bereich in der bisherigen Forschung meist im Hintergrund geblieben ist: der Aspekt von Zeit und Zeitlichkeit und deren Bedeutung für Genese, Form und Rollen von Ornamentik. Der Ansatz unseres Essays ist es daher, einen Blick auf den Zusammenhang von Zeit und Ornament aus interdisziplinärer Perspektive zu werfen, der Erklärungsmöglichkeiten zur sozio-kulturellen, aber auch allgemein lebensweltlichen Einbindung von Ornamentik in den Mittelpunkt stellt. Zunächst stellen wir jeweils kurz die historische Entwicklung in beiden Disziplinen mit Fokus auf das Thema Ornamentik vor, um dann die Verbindung von Ornamentik und Strukturierung von Zeit sowohl durch die archäologisch-ethnoarchäologische als auch durch die psychiatriehistorische Linse genauer zu betrachten. Dabei zeigen sich strukturelle Gemeinsamkeiten zum Einen in Bezug auf Zeit als Ressource und zum Anderen auf Performativität und die Wirkmächtigkeit von Prozessen.

ORNAMENT UND SCHMUCK ALS PROXY FÜR SOZIALE DIFFERENZIERUNG IN DER ARCHÄOLOGIE

Reich Ornamentiertes, in der Herstellung sehr Zeitaufwändiges wird im archäologischen Kontext oft als Prestigegut und damit Anzeiger des Status hochstehender Individuen in einer hierarchischen Gesellschaft verstanden. Prominent sind hier Interpretationen als Prestigemarker im Sinne der *costly signalling theory*, also als Zur-Schau-Stellung von seltenen oder schwer herzustellenden Gütern zu Erhaltung oder Verbesserung des sozialen Status (Plourde 2008). Auch aus kognitiv-semiotischer Perspektive kann prähistorisches Schmuckwerk als materielles Zeichen (Index) für Prestige und Reichtum gedeutet werden (Iliopoulos 2016). Hintergrund sind jeweils ökonomisch-kapitalistische Paradigmen in der archäologischen Wissenschaft, die eine Denkweise in "Ressourcen" bedingen und so den Interpretationsrahmen entsprechend setzen.

Andere gängige archäologische Fragestellungen bezüglich Ornamentik bei prähistorischen Hinterlassenschaften zielen auf weitere Funktionen als Informationsträger, etwa in Form von Identitätsmarkern (z. B. Mattsen 2021) oder rituellen Symbolen. In einer Arbeit über paläolithischen Schmuck fasst Robert G. Bednarik ein breiteres Bedeutungsspektrum zusammen, das auch als Definition für Ornamentik allgemein aus archäologischer Sicht geeignet scheint:

"*They [...] may for instance be protective, warding off evil spirits or spells, or they can be good luck charms. They can signify status, and convey complex social, economic, emblemic, ethnic, or ideological meanings, or any subtle combinations of them. Their meanings can be public or private...*" (Bednarik 2008, 296)

In der archäologischen Literatur meist nicht in Betracht bezogen sind weitere, aus ethnographischen Kontexten bekannte Dimensionen wie die mögliche Beseeltheit und Wesenhaftigkeit von verzierten Objekten und auch der Verzierungen selbst in Gemeinschaften mit animistischer Lebenswelt (vgl. z. B. Nomokonova *et al.* 2024).

Das Thema Zeit spielt in den bisherigen archäologischen Annäherungen an Ornamentik meist vor allem in Form von typologischen Reihen zur Periodisierung, als Chronologie von Kontinuität und Wandel und — in letzter Zeit vermehrt — in Form der *object biography* eine Rolle (Baysal 2019, 57–70). Ein weiterer Aspekt ist der oben bereits diskutierte ökonomische Wert, der, so wird postuliert, mit der jeweils investierten Herstellungszeit wächst. Saisonalität der Arbeitsaufgaben und Tätigkeiten, die mit der Anfertigung von Verzierungen und ornamentierten Gegenständen relevant

erscheinen, wurden bisher wenig beachtet. Auch der damit verbundene Gender-Aspekt hat in archäologischer Forschung zu Ornamentik und Schmuck erstaunlicherweise bisher eine geringe Rolle gespielt, und gerade im Hinblick auf paläo- und mesolithische Darstellungen haben sich Forschende von allem auf die weibliche Form (Statuetten, Ritzzeichnungen *etc.*) konzentriert (Baysal 2019, 32). Saisonalität und zyklisch strukturierte Zeit spielt vor allem aus ökologisch-ökonomischer Sicht in archäologischen Interpretationen eine Rolle. Jüngst wiesen David Wengrow und David Graeber auf saisonale Fluktuationen von innergesellschaftlichen Machtverhältnissen und soziokulturellen Systemen hin, wobei sie solche möglichen Zusammenhänge auch für umfangreich geschmückte paläolithische Bestattungen diskutierten (Wengrow und Graeber 2015). An der Schnittstelle zwischen kognitiver Psychologie und Archäologie stehen Untersuchungen zur Rolle materieller Kultur in der Darstellung und Umsetzung interner menschlicher Zeitstrukturierung (vgl. z. B. De Smedt und De Cruz 2011). Zeit als inhärenter Faktor der Konstituierung der Ornamentik selbst ist unseres Wissens nach aus archäologischer Perspektive bisher selten untersucht worden.

„EINE NEIGUNG ZUM ARABESKEN UND ZUM ORNAMENT" – PATHOLOGISIERUNG DES ORNAMENTALEN IN DER PSYCHIATRIEGESCHICHTE

Lange Zeit wurde die Ornamentik im künstlerischen-kreativen Schaffen von Menschen in psychiatrischen Anstalten vor allem als spezifisches Symptom und Merkmal von „Irrenkunst" gedeutet. Thomas Röske, Leiter der Sammlung Prinzhorn in Heidelberg, der weltweit bedeutendsten Kollektion von Werken aus psychiatrischem Kontext, hat darauf hingewiesen, dass solche pathologisierenden Wertungen des kreativen Schaffens von Menschen in Psychiatrien historisch gesehen zunächst wenig verwunderlich sind, da deren Ergebnisse zuerst Ärzte (später auch Ärztinnen) und Pfleger:innen zu Gesicht bekamen (Röske 2018, 269). So zählte Cesare Lombroso, der als erster 1882 einen Kriterienkatalog für solche Werke aufstellte, eine „Neigung zum Arabesken und zum Ornament" sowie „eine übergroße Sorgfalt in Details" zu den Merkmalen der „Kunst der Irrsinnigen" (Röske 2018, 270). Der Psychiater und Kunsthistoriker Hans Prinzhorn, Namensgeber der Heidelberger Sammlung, verneinte zwar in seinem einflussreichen Werk „Bildnerei der Geisteskranken" von 1922 eine sichere Bestimmung von Merkmalen solcher Werke, stellte aber bei ihnen dennoch eine Tendenz zum *horror vacui* fest — also das Bedürfnis, alle leeren Flächen eines Bildes mit Mustern oder Ornamenten zu füllen (Prinzhorn 1920/2011, 294).

Entgegen der Vorsicht Prinzhorns bei der Bestimmung eindeutiger gestalterischer Merkmale für Werke psychisch Kranker hielt sich über seine Zeit hinaus und vereinzelt auch bis in die Gegenwart die Vorstellung, dass es möglich sei, typische ästhetische Kriterien für Werke aus psychiatrischem Kontext aufzustellen. Obwohl es eigentlich naheliegend ist, dass von der Gesellschaft abgesonderte Menschen vereinzelt mit dem Zeichnen oder plastischen Arbeiten begannen, *„weil sich damit Zeit strukturieren ließ, von der die Alleingelassenen oftmals reichlich hatten"* (Röske 2018, 269), scheint der Faktor Zeit hier bisher insgesamt vernachlässigt worden zu sein.

Bis in die zweite Hälfte des 20. Jahrhunderts waren jahrelange oder sogar endgültige Aufenthalte von sogenannten Langzeitpatient:innen in psychiatrischen Anstalten die Regel. Hierbei sind länderspezifisch unterschiedliche Entwicklungen der psychiatrischen Versorgung zu beachten — in diesem Beitrag wird der Fokus auf die psychiatrische Versorgung im deutschsprachigen Raum gelegt. Die spezifischen Zeitabläufe des Anstaltskosmos waren dort für die Patient:innen überwiegend fremdbestimmt und dominiert von Dienstplänen, vorhandenem Personal, Arbeit und Monotonie. Wie der Journalist Klaus Hartung im Zuge der Kritik der Psychiatrie in Deutschland 1981 feststellte, war für die Psychiatrie „die Lebenszeit des Patienten Rohstoff, der unbegrenzt zur Verfügung steht." (Hartung 1981, 8). Feste wie Erntedank, Kommunion und Konfirmation, Karneval und Weihnachten stellten Höhepunkte innerhalb dieser immer gleichen, zyklischen Abläufe dar.

Da es bis in die 1970er Jahre die Regel war, dass Ärzt:innen, Pflegekräfte und Patient:innen alle zusammen in der Anstalt wohnten, dürfte den Behandelnden dieser Faktor eigentlich nicht verborgen geblieben sein. Allerdings schien eine in Deutschland bis in die 1960er Jahre herrschende Lehrmeinung, psychische Krankheiten seien endogen bedingt, den Blick auf die sozialen Auswirkungen des damaligen Anstaltskosmos und seiner Zeitabläufe zu verstellen. Auch Hans Prinzhorn berücksichtige nicht die sozialen Bedingungen „künstlerischen Tuns", sondern sah dieses in „elementaren psychischen Konflikten" begründet (Röske 2008, 105).

Psychiater, die sich im Anschluss an Hans Prinzhorn in den 1950er und 1960er Jahren mit Kunst aus psychiatrischem Kontext befassten, blieben der Erklärung ihrer vermeintlichen stilistischen Merkmale aus der inneren Verfasstheit der Kreativen treu. So nannte Helmut Rennert, ab 1958 Lehrstuhlinhaber für Psychiatrie an der Universität Halle/Saale, in seinem Buch „Merkmale schizophrener Malerei" von 1962 fast einhundert

derartige Merkmale. Hierin definierte er eine „stereotype Wiederholungstendenz“ als typisch für die Ornamentik bei der Malerei schizophrener Menschen. Mehr noch, er verstand die figurative Wiederholung als typisch für den „schizophrenen“ bildnerischen Ausdruck und als „regressives Phänomen“, da Ornamentik die „primitivste“ Wurzel der Kunst sei (Martinovic 2022, 98–99). Abgesehen von der insgesamt kritisch zu sehenden empirischen Grundlage seiner Studie, bezieht sich Rennert damit auf eine „*‚klassische‘ Ästhetik, die auf Ordnung, Klarheit und Kohärenz ausgerichtet ist*.“ (Röske 2012, 110). Damit erscheint ihm die Abweichung von dieser ästhetischen Norm als das „Kranke“, was bei der „stereotypen Wiederholungstendenz“ ornamentaler Gestaltung die „Regression“ meint (Röske 2012, 110). Durch diesen theoretisch-konservativen Ansatz blieb auch Rennert blind für Zeit als sozialen Faktor ästhetischer Gestaltung.

Bei dem österreichischen Psychiater Leo Navratil und seinem einflussreichen, 1965 erstmals erschienenen Buch „Schizophrenie und Kunst“ lässt sich eine ähnliche Tendenz beobachten. Hier gestattet es die Herauslösung des kreativen Schaffens von Patient:innen aus seinen lebensweltlichen Kontexten sogar, „eigenwillige psychologische Deutungen über ältere außereuropäische Kunst“ vorzunehmen, indem der Autor annimmt, der „*horror vacui*“, die „Angst vor leeren Stellen“, habe schon die Ornamentik des „alten Kulturvolks der Maya“ bestimmt (Röske 2008, 110); er erinnerte auch an die magische Bedeutung gestalterischer Elemente zur Abwendung des „bösen Blicks“ in der „afrikanischen Kunst“ (Navratil 1976, 65). Wie Leo Navratils Schweizer Kollege Alfred Bader in ihrem gemeinsamen Werk „Zwischen Wahn und Wirklichkeit“ von 1976 ausführt, sei diese „Angst vor leeren Stellen“ vor allem der gestörten Umweltbeziehung des an Schizophrenie erkrankten Menschen geschuldet, der dann vollkommen „unter Zwang“ stehe. Dies äußere sich im kompletten Ausfüllen, ja „Vollstopfen“ des Bildraums (Bader 1976a, 268).

Während Hans Prinzhorn 1922 selbst in seinem Werk „Bildnerei der Geisteskranken“ hinsichtlich des „*horror vacui*“ einschränkte, dass empirisch noch nicht geklärt sei, ob es sich dabei tatsächlich um ein „Angsterlebnis an leeren Stellen“ oder um einen „hemmungslosen Drang (…), Spuren des eigenen Erlebens spielerisch auszuschütten“ handelt (Prinzhorn 1920/2011, 294), nahmen Leo Navratil, Alfred Bader und Helmut Rennert in ihren Darstellungen aus den 1960er und 1970er Jahren eine solche pathologische Begründung ornamentaler Gestaltungsmerkmale an. Die Langlebigkeit dieser Symptombestimmung schizophrener Malerei verwundert vor dem Hintergrund der Ausdifferenzierung der Kunst im 20. Jahrhundert umso mehr: So sei es schwer verständlich, wie Thomas Röske feststellt, die „Neigung zum Arabesken und Ornamentalen“ nach dem „Aufkommen der Abstraktion (…) noch als spezifisch für eine psychische Krankheit zu werten.“ (Röske 2012, 109).

DIE STRUKTURIERUNG DER ZEIT: ALTERNATIVE ERKLÄRUNGSANSÄTZE

Gedehnte Zeit: Muße, Kreativität, Flow

Alternativ zu den oben ausgeführten dominierenden Deutungen von zeitintensiven Ornamentierungen (Archäologie: als besonders wertvoll und prestigeträchtig, Psychiatrie: als pathologisch) möchten wir hier die Überlegung ins Spiel bringen, dass solche elaborierten Dekore auch ein genuines Resultat menschlichen Wirkens vor dem Hintergrund von umfangreich zur Verfügung stehender Zeit sein können — Zeit, die nicht für die Befriedigung der Grundbedürfnisse eingesetzt werden muss. Ganz andere Beweggründe und Mechanismen können eine Rolle spielen, die mit „gedehnter Zeit“, dem Vorhandensein von Zeit im Überfluss, verbunden sind.

Was den Faktor Zeit betrifft, ist der Kontext in beiden Feldern in gewisser Hinsicht vergleichbar: In prähistorischen, aber auch sub-rezenten und heutigen Jäger-Sammler-Gesellschaften der gemäßigten und der arktischen Zone ist das Leben der Menschen in ihrer Welt stark von saisonalem Wandel geprägt und damit durch einen immer wiederkehrenden Zyklus strukturiert. Diese zyklische Zeit beruht auf verlässlicher Wiederholung, wie sie sich z. B. auch in den Kalendersystemen indigener Gruppen niederschlägt, planbare Fixpunkte wie saisonale Hochs des Vorkommens bestimmter Ressourcen, ökonomische Aktivitäten und wiederkehrende Feste strukturieren den Jahreslauf. Gerade die Winter sind es, in denen gedehnte Zeit in Form langer tätigkeitsarmer Perioden regelmäßige und planbare Muße bietet auch für Verrichtungen, die nicht mit der Befriedigung der Grundbedürfnisse in Verbindung stehen. Ganz ähnlich gestaltete sich die Situation für Langzeitpatient:innen in psychiatrischen Anstalten: auch hier strukturierten jahreszeitliche Abläufe mit bestimmten Fixpunkten und immer wiederkehrenden saisonal spezifischen Perioden die Zeit, wobei zu füllende Zeit oft im Überfluss und häufig auf lange Jahre vorhersehbar zur Verfügung standen.

In der Kulturanthropologie näherte man sich an den Aspekt der Freizeit (im Englischen etwas umfassender definiert im Begriff „*leisure*“) über die Unterscheidung

von utilitaristischer Kultur und expressiver Kultur an (Chick 2006). Expressive Kultur bezeichnet dabei den nicht-utilitaristischen, „intrinsisch motivierten" Bereich — allerdings ist inzwischen klar, dass auch expressive und *leisure*-Aktivitäten sehr wohl vielfältige gesellschaftliche, kulturelle, psychologische, politische und rituelle Funktionen haben können und damit ebenfalls im weiteren Sinne utilitaristisch sind. Man denke hier zum Beispiel an Märchen und Geschichten, an Spiele und nicht zuletzt auch an Ornamentik und Verzierung. Der Zeitaufwand etwa der Erstellung von Ornamenten kann daher auch relational, also Teil einer Beziehung zwischen der herstellenden Person und einem Gegenüber sein. Zeit kann dabei die Gabe an das Gegenüber im Sinne einer reziproken Beziehung sein, die durch die aufwändige Ornamentik eher hergestellt als dargestellt wird (frdl. Mitt. Stephan Dudeck, Berlin). Bereits Bronisław Malinowski (1931) verstand Freizeit als die Domäne der Lebenswelt, in der Kreativität und kulturelle Innovation stattfinden können. Im psychosozialen Feld ist gut dokumentiert, wie künstlerisches Schaffen, Kreativität und Freizeitaktivitäten im Zusammenhang mit mentalen Problemen dazu beitragen, Zeit sinnstiftend zu strukturieren (vgl. z. B. Borovica *et al.* 2024). Gerade im Zusammenhang mit der Erschaffung umfangreicher, zeitintensiver ornamentaler Werke bietet auch der Begriff des Flow — als Erfahrung, wie Aktivitäten des täglichen Lebens mit Bedeutung aufgeladen und als angenehm erlebt werden — einen wichtigen Ansatzpunkt (vgl. Elkington 2017).

Im Folgenden illustrieren wir den angerissenen Zusammenhang von Muße, Kreativität und Ornament anhand dreier Beispiele aus den beiden Forschungsfeldern.

Beispiel 1

In der archäologischen Literatur zählen die Gräber von Sungir, Russland, zu den ältesten sogenannten „reichen" Jäger-Sammler-Bestattungen (Wengrow und Graeber 2015). Es handelt sich um eine Einzel- und eine Doppelbestattung aus der Hochphase der letzten Eiszeit vor *ca.* 26.000–30.000 Jahren, die ungewöhnlich umfangreich mit tausenden von Perlen aus Mammutelfenbein, hunderten gelochten Fuchszähnen und weiteren Gegenständen ausgestattet waren (Abb. 2). Schätzungen des Zeitaufwands, der allein in die Herstellung der insgesamt *ca.* 13.000 Elfenbeinperlen der drei Bestatteten geflossen ist, schwanken zwischen 3250 und 9759 Arbeitsstunden, was einer Arbeitszeit einer Person zwischen 81 und 244 Wochen (bei einer 40h-Woche) entspricht (Trinkaus *et al.* 2014, 25). Obwohl dieser Zeitaufwand zunächst immens erscheint und deshalb zu den Gründen zählt, warum diese Bestattungen im Zusammenhang mit möglichen gesellschaftlicher Differenzierung diskutiert werden, weisen Eric Trinkaus und seine Kolleg:innen darauf hin, dass diese Perlen von mehreren Personen über einen ausgedehnten Zeitraum hinweg — möglicherweise über Jahre in vielen langen Wintermonaten — hergestellt worden sein konnten und teils vielleicht auch lange im Umlauf waren (darauf deuten Funde von Elfenbeinperlen in der Kulturschicht hin), bevor sie als Kleidungsornamentik der Bestatteten in die Gräber gelangten (Trinkaus *et al.* 2014, 26). Da aus dieser Zeit nur eine sehr geringe Zahl von menschlichen Bestattungen bekannt ist, lässt sich nicht sicher einschätzen, inwieweit die aufwändige Verzierung der Kleidung Toten von Sungir etwas Besonderes oder aber zumindest in dieser Region vielleicht die Norm war.

Beispiel 2

Eindrucksvolle Beispiele reich verzierter Alltagskleidung und noch aufwändiger gestalteter Kleidung für besondere Anlässe finden sich bei den subrezenten und heutigen indigenen Jäger-Fischer-Rentierhalter-Gemeinschaften der nordeurasischen Taiga und Tundra. Stellvertretend beleuchten wir hier die Kleidung der Nganasan, einer samojedischsprachigen Gruppe auf der nordsibirischen Taimyr-Halbinsel. Unsere Abbildung 3 zeigt einen Alltagsparka für Frauen, genäht aus weißem Pelz. Sorgfältig ausgeführte rote und schwarze Säume, Streifen und Quasten sowie mosaikartige Muster dienen nicht nur der Verzierung, sondern kodieren auch Informationen etwa zum Familienstand der Trägerin und haben teilweise schützende und identifizierende Funktion (Lopulenko 2005, 582–585). Ähnlich wie bei anderen nördlichen Gruppen ist das Jahr der Nganasan in eine Sommerperiode (vier Monate) und eine Winterperiode (acht Monate) geteilt. Die Herstellung der traditionellen Kleidung obliegt den Frauen; die besonders aufwändige Winterkleidung und die zugehörigen Fellschuhe wurden im Rahmen der heute fast vollständig verschwundenen nomadischen Lebensweise vor allem im ersten Wintermonat, dem September, angefertigt (Lopulenko 2005, 566). Das Beispiel zeigt, dass sehr aufwändig gefertigte verzierte Kleidung Alltagsgut ohne Konnotation von sozialen Hierarchien sein kann, was nicht heißt, dass die Ornamentik ohne soziokulturelle Bedeutung ist. In der Gemeinschaft der Tschuktschen in Nordostsibirien wird reich ornamentierte Kleidung ausschließlich für ihre Bestattung zeitaufwändig hergestellt, sie dient dem Beziehungsmanagement, allerdings erst für die sozialen Beziehungen in der Unterwelt, wo sie in der Zeit nach dem Tod wichtig wird (frdl. Mitt. Stephan Dudeck, Berlin). Ähnlich aufwändige und mit symbolischen Bedeutungen versehene Ornamentierungen an Textilien nomadischer Gruppen von Jäger-Fischern und Hirten finden sich z. B. in der Pelz- und Perlenornamentik der westsibirischen Chanten (Sokolova 2005) und in den bestickten Jurtenwandbehängen der kasachischen Nomaden im Altai-Gebirge (Oktjabr'skaja und Čeremysin 2000).

Abb. 2. Grab 1, Sungir, Russland. Bestattung eines Mannes mit Resten von Verzierung der Kleidung, Jungpaläolithikum (© Libor Balák).

Beispiel 3

Das äußerst umfangreiche Werk des Berner Psychiatrieinsassen Adolf Wölfli (1864–1930) umfasste neben Schriften, selbstentwickelten Musikstücken und Collagen eine Vielzahl von Zeichnungen, die während seines 35 Jahre andauernden Aufenthalts in der Anstalt Waldau (Schweiz) entstanden. Zu Beginn seines Anstaltsaufenthaltes soll er aggressiv und unruhig gewesen sein, später habe das ungestörte Zeichnen zu seiner Beruhigung beigetragen (Bader 1976b, 187). Sein zeichnerisches Werk ist durch rhythmisch-ornamentale Komponenten bestimmt, die von Psychiatern als typisches Merkmal „schizophrener" Bildgestaltung gedeutet wurde: Mit der „streng geometrische Ordnung im Bildaufbau" (siehe Abb. 4) habe Wölfli „dem drohenden Chaos eine neue Struktur" entgegengestellt (Bader 1976b, 190). Gegenwärtige, weniger pathologisierende Perspektiven auf sein Werk betonen eher die Mischung autobiografischer und fiktionaler Aspekte seines *opus magnum* (Slominski 2022, 64–67). Darüber hinaus kann berücksichtigt werden, dass der Beginn von Wölflis kreativer Tätigkeit nach etwa fünf Jahren Anstaltsaufenthalt ihm in den folgenden drei Jahrzehnten zur Strukturierung der Anstaltszeit selbst diente. Mit seiner sich auch hieraus speisenden Ornamentik erregte der Künstler früh die Aufmerksamkeit kunstinteressierter Psychiater, wurde auf der „documenta V" 1972 gleichberechtigt neben anderen Werken ausgestellt und gilt seit längerem als „Klassiker" der „*Art brut*". Die Einbettung seines Schaffens in die festgelegten, alltäglichen Abläufe in der Anstalt müsste dazu genauer betrachtet werden, was hier nicht geleistet werden kann.

Abb. 3. Nganasan, Westsibirien. Frauen-Alltagsmantel aus Rentier- und Hundefell mit Verzierungen (Etnosy Sibirii 2009, Abb. 7.21).

Wirkmächtige Zeit: Ornamentierungsprozess als Magie

Im eingangs zitierten Beitrag zur Funktion von Ornamenten identifiziert Vlad Glăveanu als Aufgabe für zukünftige Forschungen einen Fokus auf den Akt des Ornamentierens selbst, und nicht nur auf dessen Ergebnis. Er sieht großes Potential in einer theoretischen Durchdringung dieses Akts als „embodied action", als Rhythmus (Glăveanu 2014, 99). In diese Richtung geht auch der zweite Aspekt des Spannungsfeldes Zeit und Ornament, den wir im gegebenen Rahmen nur andeuten können. An dieser Stelle möchten wir dennoch einige Fragen aufwerfen, die sich anhand (ethno)archäologischer und psychiatriehistorisch-künstlerischer Beispiele auftun: Welche Rolle spielt das „enactment" von Ornamenten und Mustern, welche persönliche, soziale, rituelle Bedeutung kann es haben? Kann der Prozess des Herstellens an sich bereits ein Mittel zur (magischen, rituellen) Einflussnahme sein? Können Dinge dadurch von einem Zustand in einen anderen übergehen, animiert werden, Wirkmächtigkeit erlangen? Wie können sich solche verkörperten, ausgeführten Rhythmen materiell niederschlagen, wie werden sie „notiert"?

Vor dem Hintergrund der Artefaktbiographien ist es hier der Herstellungsprozess der Ornamentik selbst, der funktional ist und dem Bedeutung innewohnt. Dieser Prozess kann auf das engste mit der Person des/der Herstellenden verbunden sein, wie in unserem Beispiel 4, den brieflichen Beschwörungsakten von Emma Hauck (siehe unten). Er kann aber auch Bedeutung für Gruppen sozialer Akteure einschließlich Hersteller:innen und Rezipient:innen haben, etwa zur Notation von rituellen Abläufen, notwendigen Schritten und ihrer Rhythmik dienen, wie in Beispiel 5, dem Bärenlied-Stab der Jugan-Chanten. Archäologisch relevant ist dieses Beispiel, wie ethnographisch-ethnoarchäologische Informationen im Allgemeinen, nicht als konkrete Analogie zu archäologischen Funden, sondern als Mittel zur Erweiterung des Blicks der Forschenden jenseits des eigenen Erfahrungshorizontes für ein breiteres Spektrum an Möglichkeiten der Erklärungen und sozio-kulturellen Hintergründe für Muster in der materiellen Kultur (David und Kramer 2001).

Abb. 4. Adolf Wölfli, „Braut Ring", 1905, 75 x 100 cm (© Sammlung Prinzhorn, Universitätsklinikum Heidelberg).

Beispiel 4

Emma Hauck (1878–1920) wurde 1909 in die Heidelberger Psychiatrische Universitätsklinik gebracht, weil sie sich von ihrem Mann bedroht fühlte. Nachdem sie auf ihre dringlichen Bitten wieder entlassen wurde, kam sie nach kurzer Zeit erneut in die Klinik und wurde schließlich in die Anstalt Wiesloch überwiesen, wo sie 1920 starb (Röske 2017, 27). Während ihrer zweiten Aufnahme in Heidelberg verfasste sie mehrere Briefe an ihren Ehemann, die nicht zugestellt wurden. Ein solcher Brief wurde bereits in Hans Prinzhorns „Bildnerei der Geisteskranken" unter der Rubrik „Objektfreie, ungeordnete Kritzeleien" abgebildet — und zwar falschherum (Prinzhorn 1922/2011, 60). Tatsächlich zeigen die Briefe wiederholte Überschreibungen der Wörter „Herzensschatzi komm", „komm komm", in der „vergebliche Sehnsucht nach Nähe (…) zu einem eindrücklichen Schriftbild" gerinnt (Röske 2017, 27) (Abb. 5). Die zeitliche Dimension dieser Sehnsucht kommt in der blattsprengenden Wiederholung der geschriebenen Wörter zum Tragen, die am Ende keine lesbare Korrespondenz entstehen ließen, sondern als ornamentale Spuren des Schreibprozesses vom vergeblichen Akt des Sehnens und Herbeiwünschens zeugen.

Beispiel 5

Wie bei anderen indigenen Jäger-Fischer-Gruppen der eurasischen Waldzone, hat der Bär für die Gemeinschaft der Jugan-Chanten in Westsibirien besondere Bedeutung als heiliges Wesen, Menschen-Verwandter und Wald-Ältester. Auf die erfolgreiche Bärenjagd muss daher ein Bärenfestival folgen, das anhand zahlreicher Rituale die Wiederauferstehung des Bären in der Welt sicherstellen soll (Jordan 2003, 123; Dudeck 2016, Abb. 6). Mit diesem Ritual ist als spezifisches Objekt materieller Kultur der gekerbte Bärenlied-Stab aus Kiefernholz verbunden (Jordan 2003, 119–120) (Abb. 6). Jeder Stab repräsentiert einen Bären und jede Kerbe eines der rituellen Lieder, die bereits gesungen wurden. Diese Notation durch Kerben dient den Menschen als Gedächtnisstütze, um das Festival-Ritual korrekt auszuführen, denn die Lieder selbst und ihre Abfolge sind wirkmächtig, da sie teilweise direkt auf Geister einwirken — aus diesem Grund dürfen solche

Abb. 5. Emma Hauck, „Herzensschatzi komm" [Brief an den Ehemann], 21.7.1909/19.8.1909, Bleistift auf Papier, 16.4 x 10.5 cm (© Sammlung Prinzhorn, Universitätsklinikum Heidelberg).

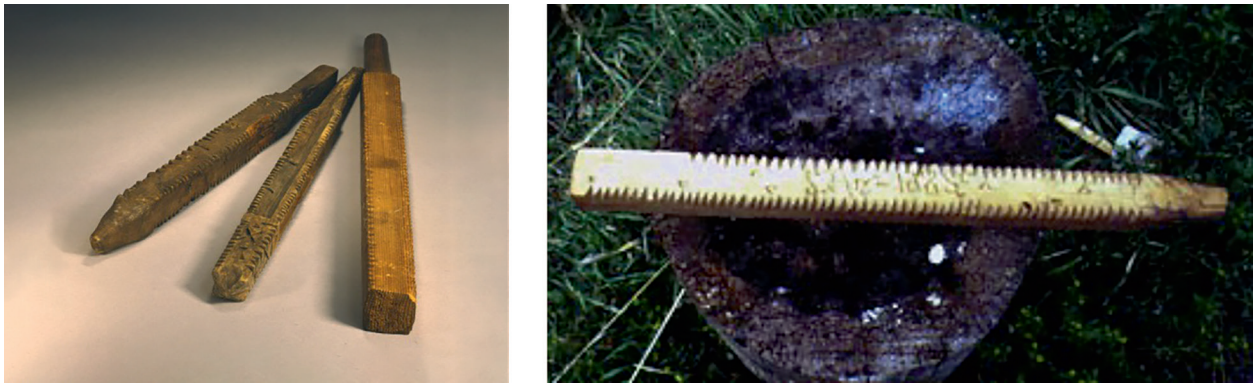

Abb. 6. Zählstabe für Lieder während der Bärenfestivals, Gemeinschaft der Jugan-Chanten, Westsibirien (© Elena Perevalova, Museum Natur und Mensch, Chanty-Mansijsk).

Lieder auch nicht nur in Teilen gesungen oder notiert werden (frdl. Mitt. Stephan Dudeck, Berlin). Als „kommunikativer Schnitzakt" ähnelt die Praxis der Liedkerbungen den Ritzungen eines Bärensymbols und Kerben für die Anzahl der Jäger in einen Baum direkt nach der erfolgreichen Jagd, die sich an Torum, den oberen Herren der Geisterwelt und Besitzer des Bären richtet und ihn über Kernaspekte der spezifischen Jagd unterrichtet (Jordan 2003, 118). In beiden Fällen dient der Schnitzakt selbst der Kommunikation (mit Menschen und/oder Geistern), die symbolischen Schnitzbilder am Baum und die Rhythmik der Kerben am Stab bilden die materiellen Spuren dieser Kommunikationsprozesse.

FAZIT UND AUSBLICK

Wenn es auch weit auseinanderliegende Themenfelder sind, verbindet eine spezifische Auseinandersetzung mit Kunst von Menschen in psychiatrischen Anstalten und mit aufwändiger Ornamentik im archäologischen Befund die Vernachlässigung wichtiger Aspekte der lebensweltlichen Entstehungskontexte. Der Faktor Zeit als immaterielle Bedingung menschlichen Schaffens kann hier leicht aus dem Blick geraten, was in der Folge zu einseitigen oder unvollständigen Interpretationen führen kann: umfangreiche, zeitintensiv hergestellte Verzierungen seien Ausdruck von Reichtumsunterschieden und gesellschaftlicher Ungleichheit, eine überbordende und blattsprengende Ornamentik in der „Bildnerei der Geisteskranken" (Hans Prinzhorn) sei „psychopathologischer" Ausdruck eines *„horror vacui"* bzw. sich im kreativen Schaffen niederschlagender Krankheitssymptome. Nimmt man für beide Felder jedoch den Zeitaspekt gezielt in den Blick, so die Gedankenanregung des vorliegenden Essays, ergeben sich zusätzliche bzw. neue Schlüsse.

Zum einen wird das Ornament so zum expressiven Element der Strukturierung von vorhandener Zeit, die dabei zyklisch akkumuliert: in Jäger-Sammler-Gemeinschaften etwa durch Jahreszeiten und klimatische Bedingungen, bei Psychiatrieinsass:innen bis weit in die Hälfte des 20. Jahrhunderts durch jahrzehntelange Einschränkungen in der Bewegungsfreiheit und die Abhängigkeit von den Anstaltsroutinen und -ressourcen. Möglicherweise kann so, um im metaphorischen Bild des Akkumulators zu bleiben, das Ornament als kreative Entladung gesammelter Zeit verstanden werden, die aufgrund äußerer Umstände nicht anders verwendet werden kann. Jedenfalls muss davon ausgegangen werden, dass im Falle der Kunst von Anstaltspatient:innen des 20. Jahrhundert die rein psychopathologische Interpretation von ornamentalen Elementen fehlgeleitet ist. Auf der anderen Seite ist der Aspekt der Zeitstrukturierung für Ornamentales in der *„Outsider Art"* nicht allein abhängig von Anstaltskontexten alter Prägung, wie aktuelle Werke zeigen — sie können auch selbstbestimmt erfolgen (z. B. etwa die Künstlerin „Margot", Margot 2019). Insofern gilt es auch hier, alte *„Pitfalls"* nicht durch neue zu ersetzen.

Zum anderen kann ornamentale Wiederholung auch materiell fixiertes Zeichen von wirkmächtigen Prozessen sein, bei denen die wiederkehrende Notation der eigentliche Zweck, das eigentliche Anliegen ist, sei es als vermutlich magische Beschwörung wie in unserem Beispiel der Brief-Blätter der Emma Hauck, sei es als Gedankenstütze für den korrekten Ablauf von Ritualen wie im Beispiel des Bärenfestival-Stabes.

Ohne Zweifel bietet die Thematik, die wir in unserem Essay nur oberflächlich anreißen konnten, viel Potential für weiterführende Untersuchungen. Warum gibt es menschliche Gemeinschaften, in deren Lebenswelt Ornamentik fast keine Rolle spielt, wie etwa bei

Teilen der vorspanischen Bevölkerung der Kanarischen Inseln, und spielen Muße und jahreszeitliche Strukturierung hierfür eventuell eine Rolle? Ließe sich mit einem *cross-cultural* Ansatz anhand archäologischer und ethnographischer Daten ein Zusammenhang zwischen regelmäßigen langen Zeiten der Muße (z. B. lange kalte Winter) und besonders zeitaufwändiger Ornamentik bzw. Gebrauchskunst auch statistisch nachweisen? Finden sich Zusammenhänge zwischen gedehnter Zeit und ornamentalem Ausdruck auch in weiteren Bereichen wie etwa bei Kunst im Gefängnis? Disziplinübergreifende gemeinsame Forschungen können in Zukunft mehr Licht auf diesen Bereich der *conditio humana* werfen.

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LITERATUR

Álvarez Fernández, E. und Jöris, O., 2008. Personal ornaments in the early Upper Palaeolithic of Western Eurasia: an evaluation of the record. *Eurasian Prehistory* 5(2), 31–44.

Bader, A., 1976a. Dynamik des Inhaltlichen. *In: Bader und Navratil 1976c*, 264–270.

Bader, A., 1976b. Adolf Wölfli. *In: Bader und Navratil 1976c*, 187–191.

Bader, A. und Navratil, L., 1976c. *Zwischen Wahn und Wirklichkeit. Kunst – Pychose – Kreativität*. Luzern/Frankfurt a. M.: Bucher.

Bar-Yosef, D. und Bosch, M., 2019. Humans' Earliest Personal Ornaments: An Introduction. *PaleoAnthropology. Special Issue: Personal Ornaments in Early Prehistory*, 19–23. DOI:10.4207/PA.2019.ART121

Baysal, E.L., 2019. *Personal Ornaments in Prehistory: An Exploration of Body Augmentation from the Palaeolithic to the Early Bronze Age*. Oxford/Philadelphia: Oxbow Books.

Bednarik, R.G., 2008. Beads and cognitive evolution. *Time and Mind* 1(3), 285–317.

Borovica, T., Kokanović, R., Seal, E.L., Flore, J., Boydell, K., Blackman, L. und Hayes, L., 2024. What does leisure have to do with mental health – arts, creative and leisure practices and living with mental distress. *Leisure Studies*, 1–15. https://doi.org/10.1080/02614367.2024.2376016

Chick, G., 2006. Anthropology/Pre-history of Leisure. *In:* C. Rojek, S.M. Shaw und A.J. Veal, Hrsg. *A Handbook of Leisure Studies*. London: Palgrave Macmillan. https://doi.org/10.1057/9780230625181_3

Coomaraswamy, A., 1977. *"Ornament", Selected Papers I. Traditional Art and Symbolism*. Princeton/New Jersey: Princeton University Press.

Criticos, M., 2004. The Ornamental Dimension: Contributions to a Theory of Ornament. *New Europe College Yearbook* 15, 185–219.

David, N. und Kramer, C., 2001. Theorizing ethnoarchaeology and analogy. *In:* N. David und C. Kramer, Hrsg. *Ethnoarchaeology in Action*. Cambridge World Archaeology. Cambridge: Cambridge University Press, 33–62.

De Smedt, J. und De Cruz, H., 2011. The role of material culture in human time representation: Calendrical systems as extensions of mental time travel. *Adaptive Behaviour* 19(1), 63–76. https://doi.org/10.1177/105971231039638

Dudeck, S., 2016. *The Khanty Bear Feast revisited*. https://stephandudeck.wordpress.com/2016/04/24/the-khanty-bear-feast-revisited/ ; letzter Zugriff 5. Januar 2025

Elkington, S., 2017. Flow Theory and Leisure. *In:* K. Spracklen, B. Lashua, E. Sharpe und S. Swain, Hrsg. *The Palgrave Handbook of Leisure Theory*. London: Palgrave Macmillan UK, 417–436.

Etnosy Sibiri, 2009. *Elektronnaja enciklopedia (Krasnoyarsk)*. https://rusmuseumvrm.ru/data/mediateka/krasnoyarsk_etnosi_sibiri_elektronnaya_enciklopediya/index.php ; letzter Zugriff 11. März 2025

Gemuev, I.N., Molodin V.I. und Sokolovaeds, Z.P., 2005. *Narody Zapanoj Sibiti. Chanty. Mansi, Sel'kupy. Nency. Nganasany. Kety*. Moskva: Nauka.

Glăveanu, V., 2014. The function of ornaments: A cultural psychological exploration. *Culture and Psychology* 20(1), 82–101. https://doi.org/10.1177/1354067X13515937

Gümpel, C.F. und Röske T., 2024. Von „Psychopathologischer Kunst" zu Art brut, Outsider Art – und darüber hinaus. *Kritische Berichte* 52(1), 52–63. https://doi.org/10.11588/kb.2024.1.101459

Hartung, K., 1981. Bilder vom langsamen Ende einer Vergangenheit. *In:* P. Crepet und S. Schoop, Hrsg. *Bestandsaufnahme einer Psychiatrie*. Mailand: Electa, 7–8.

Iliopoulos, A., 2016. The Evolution of Material Signification: Tracing the Origins of Symbolic Body Ornamentation through a Pragmatic and Enactive Theory of Cognitive Semiotics. *Signs and Society* 4(2), 244–277.

Jordan, P., 2003. *Material Culture and Sacred Landscape. The Anthropology of the Siberian Khanty*. Waltnut Creek: Rowman & Littlefield Publishers.

Lopulenko, N.A., 2005. Nganasany. *In: Gemuev et al. 2005*, 545–628.

Malinowski, B., 1931. Culture. *In:* E.R.A. Seligman, Hrsg. *Encyclopedia of the Social Sciences, Vol. 2*. New York: Macmillan, 621–46.

Margot, 2019. *Windows onto the infinite*. London: Henry Boxer Gallery.

Martinovic, J., 2022. When art therapy went chemical. Alfred Bader, pharmacology, and art brut, c. 1950–1970s. *História, Ciências, Saúde – Manguinhos* 29, 93–108. https://doi.org/10.1590/S0104-59702022000500007

Mattsen, H., Hrsg., 2021. *Personal Adornment and the Construction of Identity: A Global Archaeological Perspective*. Oxford: Oxbow Books.

Navratil, L., 1976. Die Merkmale schizophrener Bildnerei. *In: Bader und Navratil 1976c*, 60–82.

Nomokonova T., Losey R.J., Gusev A.V., Kohut G., Razdymakha S., Vozelova L. und Plekhanov, A.V., 2024. The one-eyed Elder woman stitches an ornament: Needles, needle cases, and women from the Iamal-Nenets region of Arctic Siberia. *Journal of Anthropological Archaeology* 74, 101589.

Oktaviana, A.A., Joannes-Boyau, R., Hakim, B., Burhan, B., Sardi, R., Adhityatama, S., Hamrullah, Sumantri, I., Tang, M., Lebe, R., Ilyas, I., Abbas, A., Jusdi, A., Mahardian, D.E., Noerwidi, S., Ririmasse, M.N.R., Mahmud, I., Duli, A., Aksa, L.M., Mcgahan, D., Setiawan, P., Brumm, A. und Aubert, M., 2024. Narrative cave art in Indonesia by 51,200 years ago. *Nature*, 631, 814–818. https://doi.org/10.1038/s41586-024-07541-7

Oktjabr'skaja, I.V. und Čeremysin, D.V., 2000. Uzornye vojloki Altaja. *Arkheologija, Etnografija i Antropologija Evrazii* 1(2000), 109–118.

Plourde, A.M., 2008. The Origins of Prestige Goods as Honest Signals of Skill and Knowledge. *Human Nature* 19(4), 374–388.

Prinzhorn, H., 1922/2011. *Bildnerei der Geisteskranken. Ein Beitrag zur Psychologie und Psychopathologie der Gestaltung*. 7th edition. Wien: Springer.

Röske, T., 2008. Die Psychose als Künstler. Leo Navratils „Schizophrenie und Kunst" – eine Kritik. *In:* G. Theunissen, Hrsg. *Außenseiter-Kunst. Außergewöhnliche Bildnereien von Menschen mit intellektuellen und psychischen Behinderungen*. Bad Heilbrunn: Klinkhardt 103–117.

Röske, T., 2012. Zwischen Krankheitssymptom und Kunst. Werke von Psychiatrie-Erfahrenen. *In:* S. Menzos und A. Münch, Hrsg. *Das Schöpferische in der Psychose*. Göttingen: Vandenhoeck & Ruprecht 107–126.

Röske, T., 2017. Eruptionen des Unbewussten? Künstlerisches Schaffen in der Psychiatrie um 1900. *In:* K. Dannecker und U. Herrmann, Hrsg. *Warum Kunst? Über das Bedürfnis, Kunst zu schaffen*. Berlin: Medizinisch Wissenschaftliche Verlagsgesellschaft, 23–31

Röske, T., 2018. Diagnostik versus Ästhetik – Die Entwicklung der Sicht auf künstlerische Werke aus psychiatrischem Kontext. *In:* F. von Spreti, P. Martius und F. Steger, Hrsg. *KunstTherapie: Wirkung – Handwerk – Praxis*. Stuttgart: Schattauer, 269–280.

Slominski, L., 2022. *Non-Conformers. A new history of self-taught artists*. London: Yale University Press.

Sokolova, Z.P., 2005. Chanty. Odezhda, obuv', golovnye ubory, ukrashenija. *In: Gemuev et al. 2005*, 108–125.

Trinkaus, E., Buzhilova, A.P., Mednikova, M.B. und Dobrovolskaya, M.V., 2014. *The people of Sunghir: burials, bodies, and behaviour in the earlier Upper Palaeolithic*. Oxford: Oxford University Press.

Wengrow, D. und Graeber, D., 2015. Farewell to the 'childhood of man': ritual, seasonality, and the origins of inequality. *Journal of the Royal Anthropological Institute* 21(3), 597–619.

Zilhão, J., 2007. The Emergence of Ornaments and Art: An Archaeological Perspective on the Origins of "Behavioral Modernity". *Journal of Archaeological Research* 15, 1–54. https://doi.org/10.1007/s10814-006-9008-1

‘Goddesses’ and ‘Angels’
Anthropomorphic Representations in Trypillia and Beyond

Liudmyla Shatilo, Robert Hofmann

KEYWORDS: *anthropomorphic representations, figurines, Trypillia, Ore Mountains ‘angels’, interpretations*

Abstract

In searching for alternative interpretations for Trypillian clay anthropomorphic representations (from 4700 to 3000 BCE), we applied two approaches. Firstly, we newly analyse the content and style of the figurines through a quantitative approach. Secondly, we considered similar parameters of modern-day sculptures of the ‘angel’ type from the Ore Mountains in Central Germany (1820/30 until today) as they have structural similarities with Trypillia objects.

The work done allows us to assume that the significance of the studied representations, among other things, lies in the self-identification of the users and producers within their cultural and social system. Both ancient and modern figurines are likely to indirectly reflect historical changes. However, it can be suggested that in some societies, including the Trypillia complex, the importance of such objects may have been slightly overemphasised. The study of the figurative art of the Ore Mountain has opened up new perspectives on the potential mechanisms of functioning of such sculptures, in particular, how such figures may have been used, how random and unconnected the iconography of the representations might be, and how elements and the canon of representation may have been reproduced over significant chronological periods of time (by copying old samples). Following motivations for using the figurines were identified — the desire of the users and producers to express ‘their belonging’ to a regional/religious group or cultural context (in separation from others!), the maintenance of personal memories and, more general, the desire for conformity within a society and factor of symbolic entrainment. Further observations concern the appearance of large-sized sculptures in these very different contexts.

Zusammenfassung

Auf der Suche nach alternativen Interpretationen von Trypillia Ton-Figurinen (4700–3000 v. Chr.) haben wir zwei Ansätze verfolgt. Einerseits wird der Darstellungsinhalt und -stil von Figurinen mittels einer quantifizierenden Methodik analysiert. Zum anderen wenden wir ähnliche Untersuchungsparameter, wie bei den Trypillia-Figurinen, auf moderne Skulpturen des Typs ‚Engel‘ aus dem Erzgebirge in Mitteldeutschland (1820/1830 bis heute) an, da diese strukturelle Ähnlichkeiten mit Trypillia-Objekten aufweisen.

Die Bedeutung der untersuchten Darstellungen liegt u. a. in ihrer Rolle für die Selbstidentifikation der Produzenten und Nutzer innerhalb ihres kulturellen und sozialen Systems. Sowohl prähistorische als auch moderne Figurinen spiegeln indirekt historische Veränderungen wider. Allerdings haben wir auch Grund zu der Annahme, dass die Bedeutung solcher Objekte für einige Gesellschaften wie z. B. auch für Trypillia-Gemeinschaften etwas überbewertet wird. Die Untersuchung der figürlichen Kunst des Erzgebirges eröffnet neue Perspektiven auf potentielle Mechanismen, wie solche Figuren ‚funktionierten‘ insbesondere, wie sie benutzt wurden, von welchen Faktoren die Wahl der dargestellten Charaktere abhängen kann und wie Elemente und der Darstellungskanon der Figuren durch Kopieren alter Vorlagen über längere Zeiträume reproduziert werden konnten. Als Motivationen für die Nutzung von Figurinen können wir den Wunsch der Nutzer und Produzenten identifizieren, (in Abgrenzung zu anderen) ihre Zugehörigkeit zu ‚Ihrer‘ regionalen/religiösen Gruppe oder ihrem kulturellen Kontext auszudrücken und persönliche Erinnerungen zu bewahren. Weitere Beobachtungen beziehen sich auf das Auftreten großformatiger Skulpturen in diesen sehr unterschiedlichen Kontexten.

INTRODUCTION

In the Neolithic and Eneolithic archaeology of South-East Europe, clay anthropomorphic figurines of the Trypillian complex occupy an important place as they are informative, numerous and well published (Fig. 1 A). Trypillian sculptures are considered as objects of religion/art or a *source* for chronologies, spatial delimitations, and reconstructions of how the inhabitants of ancient settlements looked or dressed (*e.g.* Movsha 1973; Markevich 1981; Pogoževa 1985; Monah 2016; Burdo 2010; 2013). A separate block of hypotheses concerns the *use* of figurines and their role in ancient societies, which are sometimes difficult to verify. For example, figurines are interpreted as *sacred beings* in the form of a human and objects of magical practice or even '*goddesses*' of the 'Trypillian pantheon', which are also associated with fertility cults (*e.g.* Movsha 1973, 20; Pogoževa 1983, 114–115, 132–134; Burdo 2004). Less attention is paid to understanding the place and significance of these Trypillia objects in the system of society and its practices (for an analysis of approaches on this topic, see Ţerna 2008). This was influenced by both the nature of the material — the figurines lack obvious utilitarian functions — and the research traditions that have firmly placed this category of finds in the 'sacred' sphere. In contrast to the last, this study aims to examine ancient figurines as a '*social phenomenon*'; we believe that the figurines can be considered from the perspective of a certain 'mirror' of society and its social organisation. One of the main objectives of the work is to find possible alternative interpretations of the *role* (*significance*) and *functions* of the Trypillian anthropomorphic figurines. In order to test archaeological theories, modern wooden anthropomorphic sculptures, so called 'angels' from the Ore Mountains, Saxony, are considered in the work along with the Trypillian representations.

These two categories of the material, despite the great differences between them (visual, material, production process, historical context, *etc.*) and the insurmountable time barrier of six thousand years, have certain *structural similarities* in a number of characteristics. For both categories it is typical:

1. wide usage in the domestic context;
2. often appear in larger number (more than one) in a domestic context;
3. anthropomorphic images interpreted as predominantly female representations, sometimes with realistic details;
4. at first glance they seem not to show a pronounced stylistic evolution over significant time periods;
5. usage for certain activities associated with the traditions in these societies (that is, probably, not just as decorations and/or toys).

The presence of similar characteristics in a number of aspects made it possible to conduct additional research into the modern tradition in order to search for possible *alternative explanations* of the phenomenon of anthropomorphic representations, including prehistoric ones. It is important to notice that modern realities are in no way directly transferred to the archaeological context; we believe that the structural comparison of the two phenomena presented in this article can only provide *ideas* and *new perspectives* for the interpretation of prehistoric art objects.

RESEARCH QUESTIONS AND APPROACH

In order to study the use and meaning of the figurines, we decided to first of all turn to the topics of the content (what is depicted) and style (how it is depicted) including stylistic development of these objects. Therefore, the paper considers the following aspects: typological variability of representations, gender differentiation, size classes, styles of figurines and their stylistic development/evolution. Additionally, the topics of production and distribution of figurines are touched upon.

In search for possible *alternative interpretations* of these prehistoric images, the study considered parallelly anthropomorphic sculptures of the Trypillian complex (4700–3000 BCE) on the one hand and 'angel' type figurines of the Ore Mountains (1820/30–today) on the other (Fig. 1 B). As far as possible, they were analysed according to the same parameters despite the large differences when working on each of the categories of material.

From the methodological point of view, the observations on the Trypillian material are based on the revision and supplementation of previous typological approaches using statistical methods and a quantification approach. Thus, depending on the research question, certain characteristics or elements of the figurines were examined in detail. Then, an independent chronological analysis was carried out by aoristic distribution (by 50 year-steps, see Mischka 2004) of the number of each documented characteristic of the figurine in accordance with the dating of the settlement where they were found. In addition, available data on the number of figurines in different contexts were collected and the results of previous investigations regarding the size classes of figurines were used. The chronology of the

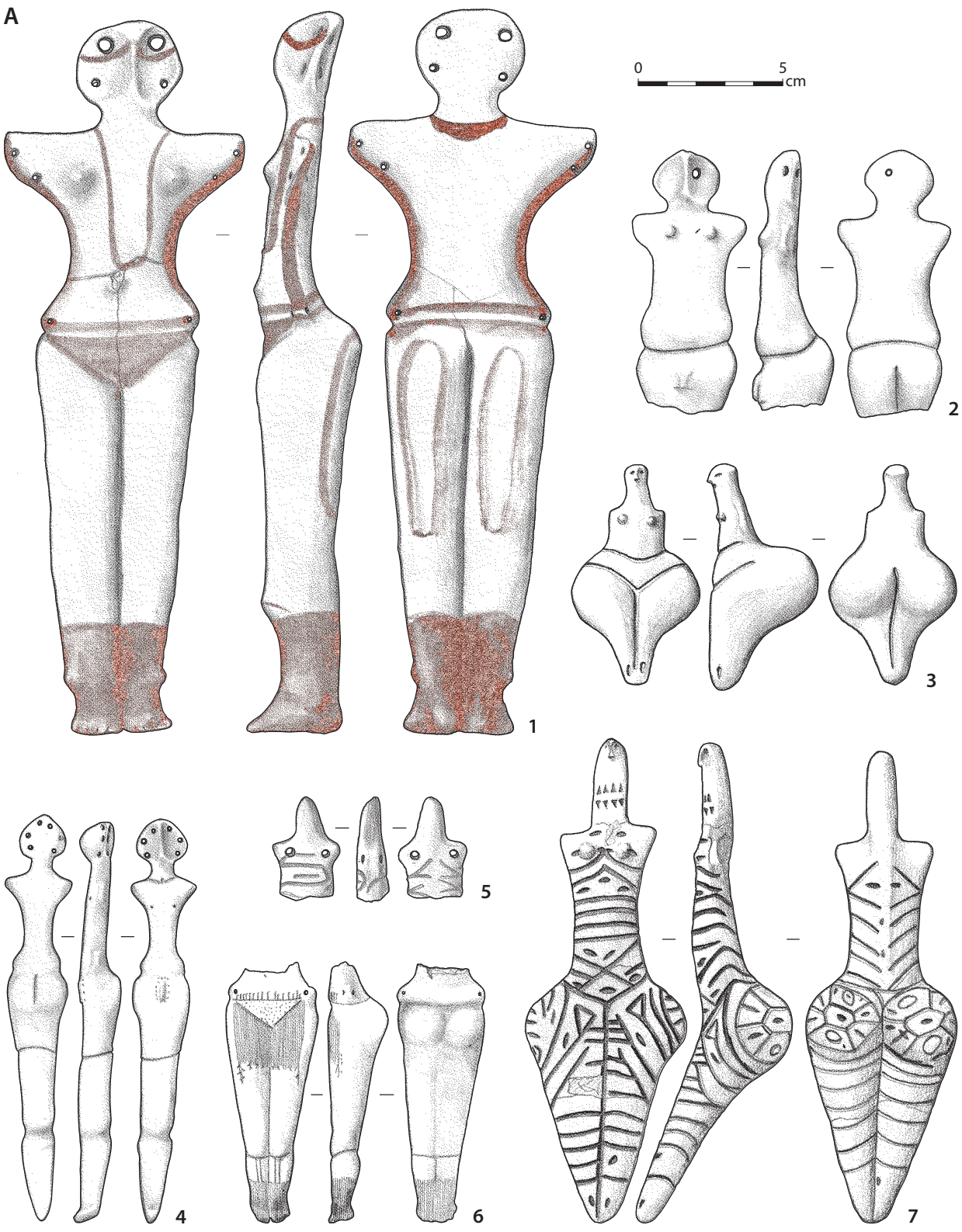

Fig. 1 (continued next page). ***A*** *Trypillian anthropomorphic figurines from* ***1*** *Koshilovcy (C1-C2 phase);* ***2*** *Medveza (B2 phase);* ***3*** *Aleksandrovka (A phase);* ***4*** *Varvarovka VIII (C1 phase);* ***5*** *Luka Vrublivetska (A phase);* ***6*** *Lomachincy (C1 phase);* ***7*** *Bernovo Luka (A phase) (Original drawings after Pogoževa 1983, adapted by Karin Winter).*

Fig. 1 (continuation). ***B*** *Examples of standing and flying figures of the Ore Mountains 'angel type' in the Biedermeier design canon, made by Günter Hofmann, Hainichen/Saxony (adapted by Karin Winter after photos from Liudmyla Shatilo, Robert Hofmann).*

sites from which the figurines in the sample come was based on modern ^{14}C dates and, in the case of their absence, on data from relative chronology (for references see Shatilo and Hofmann 2024 where we used the same approach and data on figurines).

The study of modern figurines from the Ore Mountains included long-term observations and a series of interviews with producers, users and specialists (spring and autumn 2023). For the interviews, a questionnaire was made up that avoided hints on possible answers in its formulations. For the objectivity of the results, a large number of direct (specific) questions were included. Also, work began on documenting the sculptures using archaeological methods (typology, measurements). However, this article only highlights some of the obtained results.

MATERIALS

The comparison of a number of aspects during the description of the material showed major differences in the perception of the figures directly by modern users and how the figurines are studied through the prism of research constructions. Below is an introductory description of Trypillian and modern anthropomorphic representations, including the question of the object's typology.

Trypillia 'Goddesses' [1]

Trypillian anthropomorphic figurines (from *c.* 4800 to 3300/3000 BCE) are clay sculptures that fully or partially depict human bodies. The degree of stylisation varies greatly both spatially and chronologically (*e.g.* Pogoževa 1985; Burdo 2001). In studies, figurines are often placed in a broader context of the material

1 We use the term 'goddesses', which is borrowed from the research history on Neolithic anthropomorphic figurines in South-Eastern and Eastern Europe, only as a short, memorable label to name these sculptures and distinguish them from the 'angels' of the Ore mountains. We do not share the view that the figurines under discussion represent depictions of goddesses. Since a comprehensive iconological analysis of the prehistoric figurines in the sense of Erwin Panofsky (1939) is not possible due to a lack of contextual information, we believe that when referring to prehistoric clay anthropomorphic representations, it is better to use more neutral descriptive terms, as well as to clearly separate labels and interpretation of the objects.

culture of the Trypillian complex (*e.g.* Burdo 2004; Monah 2016; Palaguta 2017; Ovchinnikov 2021a; 2021b). This includes different anthropomorphic representations (anthropomorphic vessels and ceramic with anthropomorphic details, images on dishes, pendants, *etc.*), other figurines (*e.g.* zoomorphic, ornithomorphic) and miniatures (models of buildings, chairs, *etc.*).

Anthropomorphic sculptures, like other figurines and miniatures, do not have obvious utility value; they are usually placed in the category of 'religious-magical' inventory. Despite the numerous, partly esoteric descriptions of possible cults associated with these figurines, the research almost completely lacks of their contextual analysis, apart from some individual cases.

Quantitatively, anthropomorphic sculptures are significantly superior to other Trypillian anthropomorphic and zoomorphic representations, figurines and models. According to various sources, about 4113 figurines are known today (Kruts 1977; Markevich 1981; Kruts *et al.* 1985; Pogoževa 1985; Kruts and Ryzhov 1988; Girnyk and Videiko 1989; Gusev 1995; 2009; Chernovol and Ryzhov 2005; Kruts *et al.* 2005; Burdo 2011; 2013; 2014; 2015; Yakubenko 2011; 2015; 2016; Ovchinnkiov 2014; Țerna 2017; Țerna and Vasilache 2019; Starkova 2020; Chernovol 2023; additional references on figurines from Talianki site see in Table 3).

In order to systematise this material, various typologies have been developed, which can be reduced to two basic directions. On the one hand, it is practically generally accepted to divide the entire array of figurines into schematic and realistic images (*e.g.* Movsha 1973; Burdo 2010). On the other hand, multi-stage typologies have been compiled, where types or subtypes are distinguished based on a combination or sum of a number of characteristics that can include pose, gender, decor, leg modeling *etc.* (Pogoževa 1985; Burdo 2001).

Corresponding to the content of the figurines (who or what is depicted), gender division is recognised as one of the main characteristics in many studies. It is often placed at the highest levels of classifications (*e.g.* Pogoževa 1983, Ovchinnikov 2014). Despite this, most typological constructions and the discussions or reviews rely primarily on other features (legs modelling, decoration, position, *etc.*) that certainly relate to the stylistics of the figurines.

Ore Mountain Angels

The Ore Mountain angels are made of wood and represent an anthropomorphic (female) figure with wings, which very often has candle holders in its hands. The human body is depicted quite realistically but greatly simplified. Today, these objects are part of a whole complex of wooden things from the same region, which include miners, Turks and other smokers, nutcrackers, pyramids, arks, chandeliers, *etc.*

The angel figurines discussed here arise from a Christian tradition and have their predecessors in modern Baptistry angels and Nativity scenes. Their production and use during the Christmas season is still primarily limited to the area of the upper Ore Mountains. Beyond that, they are used primarily by people with a direct link to that tradition.

Larger angel figurines are designed to hold candles and are used mainly during the Christmas season, primarily in a private domestic context. They are not cult figures but have primarily decorative functions associated with one of the most important annual complexes of Christian holidays. In many cases, angels are not used as single items but form veritable collections that are used and inherited within families over several generations, as long as wear and tear allow.

Most of the figures are depicted in standing position, while angels in flight are considerably less common. Beyond that, the differences primarily concern the size and decorative details. In general, larger autonomous figures are to be distinguished from the many smaller ones that were integrated into scenic representations in pyramids and nativity scenes. Unlike the Trypillian sculptures, both in special studies and in communication with the users, the typological division of angels is almost absent except functional division into suspended and standing ones. Talking about typology of angels is talking about Ore Mountain art inventories where angels are one of the categories.

CONTENT (WHAT OR WHO IS DEPICTED)

Trypillia 'Goddesses'

Who is depicted on the Trypillian figurines? The research tradition has generated several directions for potential answers to this question. Firstly, it is common to make a typological distinction between the figurines by gender into male and female. Secondly, a number of researchers distinguish 'iconographic' types of figures (including tracing a certain 'image' through all of Trypillian art) and interpret them, for example, as one or another 'idol' (*e.g.* Pogoževa 1983, 114, 134) of the 'Trypillian pantheon' (*e.g.* Burdo 2004, 386). In addition, it is assumed that some of the sculptures could have the character of portraits (*e.g.* Movsha 1973). Let's consider the first approach.

It is believed that the majority of the figurines depict female, while there are much fewer male figurines (above 95% and about 3%, respectively: Pogoževa 1983, 22, 107). This conclusion is based on the appearance of the sculptures, including general body proportions,[2] and the absence of obvious male characteristics. Due to the fragmentation of the material, figurines with one eye or without eyes (shown through perforations), with shoulder belts,[3] and without breasts can be classified as male representations (*e.g.* Yakubenko 2011; Burdo 2015). Sculptures that do not fit these criteria, such as male figurines with breasts, can be classified as 'androgynous' (Pogoževa 1985; Burdo 2004, 395–396). However, a number of observations show that the issue is more complex. Thus, Natalia Burdo pointed out to the stylistic similarity between male and female figurines, and to the existence of figurines without sexual designations (Burdo 2001, 63). Ilia Palaguta believes that wide hips and the presence of breast appliques do not always depict unambiguous gender characteristics. He suggests that for some Trypillia periods, the legs depicted apart, belts and shoulder belts may be considered as signs of the male gender of the figurines, although this criterion may vary and/or change over time (Palaguta 2013a, 134).

In this study, a sample of figurines with preserved pelvic parts (544 units)[4] was analysed to evaluate gender characteristics and the ratio of the so-called 'female' and 'male' representations. On this basis, five groups of images and a number of variants have been identified (Fig. 2). The groups include following sculptures: with male primary gender characteristics (group A); without attributes that can be interpreted in terms of gender differences (group B); the lower abdomen and legs are shown plastically, without additional images (group C); figurines with a V-shaped decor in the pelvic part (group D) and objects that most likely depict female primary gender characteristics (group E). The variants within the groups were identified based on the presence/absence of belts or horizontal lines in the belt area that do not encircle the figurine and their combination with images of legs (see Table 1). The chronological distribution of the sample in principle corresponds to the distribution of plastic art in more complete collections (*e.g.* Ţerna 2017; Shatilo and Hofmann 2021, fig. 5). It should be noted that there is an extremely small number of figures for the period after 3550 BCE.

The ratio of the different groups showed that images with more or less clearly defined primary gender characteristics are almost equal in quantity, representing 10% (group A) and 11% (group E) of the sample. Chronologically male figurines (group A) have existed since the beginning of the Trypillia in a small quantity, which is continuously growing, reaching its peak between 3950 and 3550 BCE. During this time interval, the number of such images exceeds 15%. After 3550 BCE, there are no representations of the group in the sample. Figurines of group E (probably female) have practically similar distribution. However, unlike male ones, such figurines continue to exist after 3550 BCE, making up to 40% of the sample, although quantitatively these are only a few figurines.

'Genderless' figurines amounted to 28% (group B) and 3% (group C). Images of group B are represented throughout the entire time period, fluctuating within 17–40%. Some of the figurines of this group (subtypes B1 and B2) dated between 3950–3550 BCE may result from poor preservation of the material, since this chronological period is characterised by the optional use of paint on sculptures.[5] The same can be said about the representations of group C.

Group D, with a V-shaped decoration in the pelvic part, is the largest (*c.* 48%). These images are not uniform and their interpretation is very ambiguous despite that they are often interpreted as female representations. Elements in the form of the letter V, or a triangle, on most of these figurines, occupy a significant part of the frontal surface of the figurines, and not only a clearly defined area, as, for example, on the figurines of group A, the gender attribution of which is obvious. Variant D11 (with small triangle depiction) is an exception, which in this study is interpreted as female representations. Images of variants D8 and D8a are decorated with a triangle, the upper side of which passes or rests on the belt, which mainly encircles the figurine. Such images can equally depict either a gender characteristic or a loincloth. Images with a loincloth are attributed to variant D10, which can also include figurines with a similar triangle, as in variants D8 and D8a, but with additional elements (for example, fringe). In this regard, several male figurines with comparable U- or V-shaped decoration or 'clothes' should be mentioned (Yakubenko 2011, table II.37; Monah 2016,

2 For example, in the early Trypillian period, most of the figurines are depicted in a 'steatopygic manner'.

3 There are a number of clear male figurines without 'eyes' or with one 'eye' (shown by perforations), as well as with shoulder belts.

4 The Aina Pogoževa catalog was taken as a basis, to which representative collections of figurines from sites B2 and C1 were added to 'stabilise' the number of figurines for these periods (Pogoževa 1985; Burdo 2001; Shmagliy 2001; Yakubenko 2011; Burdo 2011; Yakubenko 2016; and figurines from Talianki, see separate list in Table 3).

5 According to Aina Pogoževa, after 3550 BCE, most figurines were not painted.

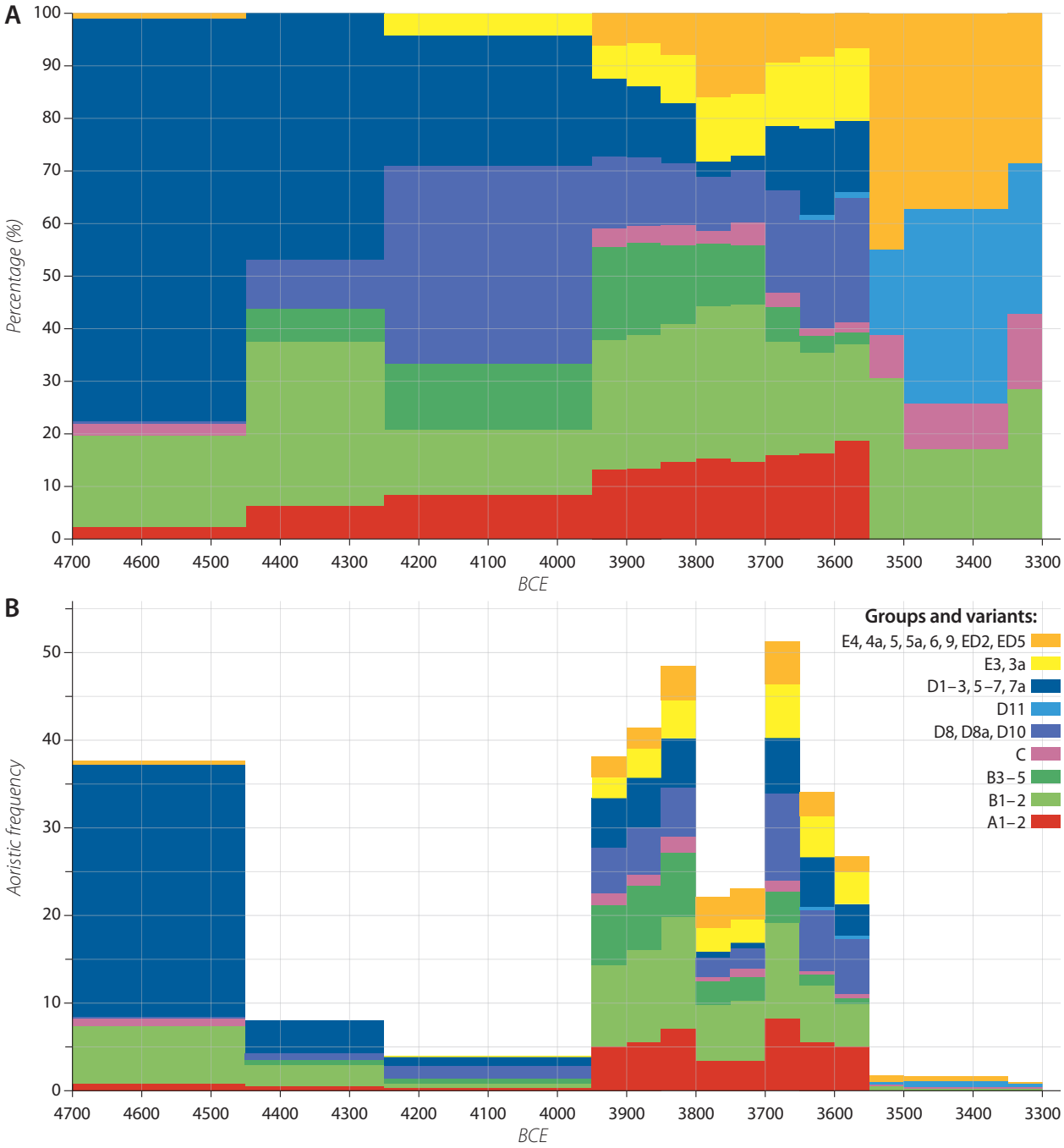

*Fig. 2. Relative (**A**) and absolute (**B**) chronological distribution of the gender characteristics of anthropomorphic Trypillia figurines.*

fig. 39.3; fig. 95.7; fig. 119.1). Quantitatively, group D predominates for Trypillia A (almost 80 %), where it is represented by four variants (D1, D2, D5, D6), mostly with pronounced steatopygia and a Y-shaped designation of the lower abdomen and legs. Then the number of such images gradually (or quite sharply if we subtract the variants with a loincloth) decreases and completely disappears in the sample by 3550 BCE (except for D11 variant).

The variants of images with *belts*, distinguished for each group, in total made up 143 figures (26 % of the sample). In groups A, B and D, figures with belts make up from 1/3 to 1/5 of the representations, and in group E about half of the images. Variants with belts appear after 4450 BCE, their number increases sharply after 3950 BCE which may be related to the spread of the 'realistic' style (see Shatilo and Hofmann 2024). It should also be noted that in some cases it is almost im-

Table 1. Decorative elements of the pelvic part of anthropomorphic Trypillian figurines: description, examples and possible interpretation in terms of gender differentiation.

Groups and variants	Description of the decorative elements in the pelvis area of the figurines	No.	%	Examples	Interpretation
A	**With male prim. gender characteristics**	**53**	**10**		
A1	Without belt	35		Yakubenko 2016, fig. 1.5, 2.3, 4, 3:1;	Male
A2	With belt	18		Yakubenko 2011, tabel 2.32; 1.14; Kruts and Ryzhov 1991, fig. 11.2; Kruts *et al.* 2005, fig. 31.4	Male
B	**No decorative elements that can be interpreted in terms of gender diff.**	**152**	**28**		
B1	Without decorative elements	87		Yakubenko 2016, fig.1.2, 2.1, 4.2,5,6	Prim. gender character., not depicted/bad preserv.
B1a	Without gender characteristic depictions, with decoration	5		Yakubenko 2011, tabel 3.55; Pogoževa 1985, fig. 519	Prim. gender character., not depicted
B2	With legs	25		Kruts *et al.*, 2001, fig. 51.6; Yakubenko 2016, fig. 1.1.	Prim. gender character., not depicted/bad preserv.
B3	With belt and legs (shown with an interval from the belt)	11		Pogoževa 1985, fig. 562, 751, 784	Prim. gender character., not depicted/bad preserv.
B4	With belt and legs shown directly below belt	15		Pogoževa 1985, fig. 525, 639, 658	Prim. gender character., not depicted
B5	Only with belt (without legs)	9		Pogoževa 1985, fig. 898, 904	Prim. gender character., not depicted
C	**The bend of the abdomen and legs shown plastically, no additional decorative elements**	**14**	**3**	Pogoževa 1985, fig. 527, 535	Prim. gender character., not depicted/bad preserv.
D	**With V-shaped decor in the pelvic part**	**263**	**48**		
D1	Y-shaped line on the whole front of the under part, that separates pelvis and legs	25		Pogoževa 1985, fig. 5, 74, 78, 545	Prim. gender character., not depicted
D2	Same as D1, upper part broken	31		Pogoževa 1985, fig. 73, 65; Yakubenko 2011, tabel 1.9, 10, 12	Prim. gender character., not depicted
D3	Only V-shaped decorative element	3		Pogoževa 1985, fig. 228, 650	Female or prim. gender character., not depicted
D5	Like D1 plus V- or U-shape line on top of Y	44		Pogoževa 1985, fig. 8, 12, 27, 52	Prim. gender character., not depicted, evtl. with belt
D6	Like D1 and D5 but richly filled with decor of several undifferentiated options	77		Pogoževa 1985, fig. 83, 84, 124, 131, 132	Prim. gender character., not depicted
D7	Big triangle, no legs	9		Pogoževa 1985, fig. 859, 863, 883	Prim. gender character., not depicted, evtl. with clothes
D7a	Big triangle with legs	12		Pogoževa 1985, fig. 849, 854	Prim. gender character., not depicted, evtl. with clothes
D8	Triangle (big can be also small) below belt, no legs	18		Yakubenko 2016, fig. 5.3; Pogoževa 1985, fig. 836, 844	Prim. gender character., not depicted, with clothes
D8a	Triangle below belt with legs	8		Pogoževa 1985, fig. 390, 707	Prim. gender character., not depicted, with clothes
D10	With probable loincloth	32		Yakubenko 2016, fig. 4.4; Yakubenko 2011, tabel 3.58, 2.35; Pogoževa 1985, fig. 203, 487, 488	With clothes
D11	Small size triangle, no belt with legs	3		Pogoževa 1985, fig. 981, 992	Female
E	**With probably female primary gender characteristics**	**62**	**11**		
ED2	Like D1	1		Pogoževa 1985, fig. 56	Female
ED5	Like D5	1		Pogoževa 1985, fig. 63	Female
E3	With belt, no legs	11		Pogoževa 1985, fig. 905, 877; Yakubenko 2011, tabel 1.1, 4.80; Ovchinnikov 2021a, fig. 5.5	Female and clothes
E3a	With belt and legs	21		Pogoževa 1985, fig. 610, 651, 790, 855, 871; Ovchinnikov 2021a, fig. 3.6; Kruts *et al.* 2005, fig. 31.6	Female and clothes
E4	No belt, with vertical line, forming triangle, no legs	5		Pogoževa 1985, fig. 691, 874, 918, 969	Female and clothes (?)
E4a	No belt, with vertic. line, forming triangle, with legs	2		Pogoževa 1985, fig. 839, 721	Female and clothes (?)
E5	No belt, no legs	2		Pogoževa 1985, fig. 671, 682	Female
E5a	No belt, with legs	7		Pogoževa 1985, fig. 965, 717, 669; Kruts *et al.* 2005, fig. 17.1	Female
E6	Upper part not preserved (not clearly with belt or line)	8		Pogoževa 1985, fig. 963, 748, 696	Female
E9	Small size of triangle without belt, with legs	4		Pogoževa 1985, fig. 982, 1022	Female

possible to draw a clear line between the potential image of clothing and female gender characteristics, for example for variants E3 and E3a. Perhaps such figures can reflect both clothing and gender.
Thus, it can be concluded that

1. all groups and variants have certain patterns of chronological distribution,
2. the selected types with more or less emphasised gender (A and E) have approximately the same number and dynamics of increase over time.

In addition, it can be assumed that

3. many figurines of variant D could depict clothing,
4. the images on some figurines can be interpreted as those that depict both gender and clothing, and
5. a clear gender distinction was not expressed for most of the material (perhaps there was no need to emphasise it).

Ore Mountain Angels

The answer to the question of who the figures from the Ore Mountains depict, is, in contrast to the Trypillia figures, quite clear: they represent angels. According to Christian tradition, angels are immaterial spiritual beings that act as intermediaries between the deity and humans and are subject to a strict hierarchy. In Christian art, they are usually depicted as adolescent males, in line with the diverse written tradition, at least until the Baroque.

By contrast, based on their shape and clothing, with bosom, narrow waist, long dress and apron, the standing angel figurines from the Ore Mountains are depicted as women (or women as angels). All of the interview partners agreed on this point. At the same time, the attitude of users towards these sculptures is quite special and extremely respectful. The figures often wear a high cylindrical hat, which might resemble the headgear of miners (*e.g.* Riebel 2003, 49), or a crown reminiscent of depictions of Mary, Mother of God in the catholic tradition.[6] According to some of the interview partners, they depict Angel of the Annunciation. However, since this is never explicitly stated by additional clues, the theological reference of the angel figures remains ambivalent.

In contrast to standing angel figures, early flying or 'hanging' angels, some of them bearing the attribute of the trombone beside of speech scrolls (or medallions) and candles, display boyish or androgynous features and an overall masculine character. Baroque baptistery or jubilee angels in churches apparently play a decisive role as image sources. Many of the later flying angel figures also take on female characteristics.

In the interviews, multiple references were made to the belief of a duality of light-bearing angel figures and roughly similar-sized figurines of light-bearing miners (*Bergmänner*) depicted in parade uniform. According to this widespread tradition, miners are understood as the male counterparts of female angels (*e.g.* Blechschmidt 1995, 68). From the point of view of the underlying different iconographic traditions, this is not really conclusive and seems to be a *secondary reinterpretation* of previously independent categories of figures (Riebel 2003, 26).

STYLE (HOW IT IS DEPICTED)

Style reflects the perception and traditions of the figurine representation. It can help in understanding their functions and meanings, as it can shed light on a number of questions including variability, stylistic development and 'evolution' of anthropomorphic representations. In addition, below we will try to understand in more detail the issues of the dynamics of the development of figurines and sculptures as a source for detailed chronological constructions, time and speed of changes in figurines.

Trypillia 'Goddesses'

The stylistic variability of the Trypillian figurines is reflected in a number of basic characteristics of the sculptures, such as the poses of the statuettes, their size, morphology and decoration.

Poses

In Trypillian research, under 'poses' are usually understood the relationship of the figurines body and lower limbs to each other. At a very general level, the sculptures can be in a standing or sitting position,

6 In Christian art in Central Europe, angels usually do not wear crowns. In Baroque art, crowns are more the attribute of Madonna. Perhaps the female angels of the Ore Mountains are derived from the Catholic sphere, where similar hybrids exist, such as the Nuremberg *Rauschgoldengel*.

distinguished by the criterion of bent knees (Pogoževa 1983, 22). In all Trypillia phases 'standing' representations dominate, although there can be observed a certain variability in poses, which cannot always be clearly classified as 'standing' or 'sitting'. For example, early Trypillian figurines with straight legs, depicted in a steatopygian manner, are considered by some researchers to be standing or leaning forward and by others, to be sitting (Pogoževa 1983; Burdo 2001; Palaguta 2013a; 2013b). Statuettes with bent knees may have different angles of inclination between the upper and lower parts (*e.g.* for Trypillia B1: Ţerna and Vasilache 2019, 41–42).

Regarding the position of the arms, for most of the figurines they are depicted schematically in the form of small stumps (short conical knobs), and a few exceptions relate either to early Trypillian images (including B1) or to realistically depicted bodies. In that case the arm postures are characterised by great variability with a fairly small sample of such figurines (Pogoževa 1983, 39 table 3).

Size classes

The sizes of the figurines, analysed elsewhere (see Shatilo and Hofmann 2021, 210–211 for details) vary from less than 5 to 70 cm in height. Small and medium figurines (5–18 cm) make up 73 % of the sample, large (18–30 cm) — 15 % and very large (30–70 cm) about 2 %. It is important to note that the appearance and spread of large figures falls on the period after 3950 BCE, and is apparently associated with the significant spread of the 'realistic' style within regions where population aggregation took place in large Trypillia settlements and mega-sites.

Sculpture styles

In general, the early figurines contrast with those from the middle and late phases. Particularly striking are the different body proportions: early Trypillian[7] figurines are characterised by a disproportionate depiction of the lower part in the so-called 'steatopygic manner', while the items of later periods show more realistic proportions, and other characteristics. In order to examine the difference between these large chronological groups of material, as well as to assess the dynamics of the development of the Trypillian figurine styles, we analysed the morphology of the upper parts of the figurines (mainly heads) in its chronological development. The upper body part was chosen to test the developed approach on a smaller sample.

Chronologically this sub-sample is not evenly distributed (Fig. 3; 258 items in total, after Pogoževa 1985 and Burdo 2010), but generally corresponds to more complete collections of figurines (*e.g.* Ţerna 2017; Shatilo and Hofmann 2024). The graph with the aoristic distribution of the sample shows two large chronological groups and almost complete absence of figures in the interval between 4250 and 3950 BCE. Contrary to expectations based on the overall temporal distribution of the figurines, there is a bit lower number of sculptures between 4700 and 4250 BCE, what might be explained by the poor preservation of the upper parts of the early Trypillian figurines (Ţerna and Vasilache 2019, 47).

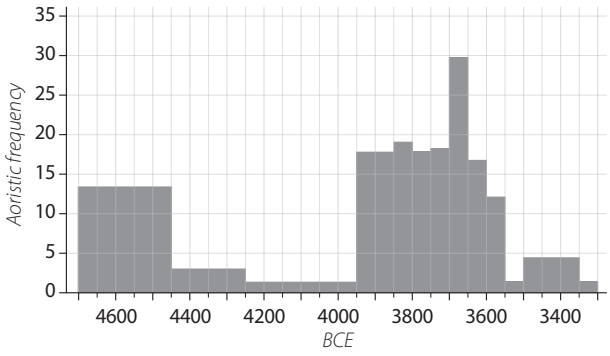

Fig. 3. Chronological distribution of the sample of upper parts of anthropomorphic Trypillia figurines used to explore their stylistic development.

Based on the sample, 50 *characteristics* or *elements* of the sculptures were identified (Table 2). They included some 'missing' details and can be grouped according to 12 aspects: ratios of the width of head and neck, face and profile, face and waist; head shape; image variants of the eyes, nose, mouth, ears, chin, hair and accessories for the head, arms/shoulders, and head perforations. Each characteristic was separately recorded (one figurine could have up to 13 such characteristics), which made it possible to compile a series of chronological graphs (Fig. 4).

Within two chronological groups (4700–4250 and 3950–3350 BCE) it is possible to trace a significant difference in *what* is depicted, and especially, *how* it is depicted. In the period between 4250 and 3950 BCE attributes of both groups, the earlier and the later one occur. This might possibly be explained, at least partly, by the effect of a statistical 'artifact', resulting from chronological uncertainties in the aoristic approach.

7 Here and further including the ones from B1 phase.

Table 2. Description of stylistic attributes of Trypillia figurines.

Aspects	Characteristics	Example after Pogoževa 1985,
Head/neck ratio	1. Head not separated from the neck	fig. 124
	2. Head practically not separated from the neck	fig. 6
	3. Head and neck are clearly separated	fig. 805
Head shape	4. Inverted U shaped	fig. 98
	5. Inverted V-shape	fig. 420
	6. Round face, half circular profile	fig. 983
	6a. Round face, half circular profile, pointed top	fig. 530
	6b. Round face, 'flat' profile	fig. 522
	7. Naturalistic profile	fig. 665
Face/profile ratio	8. Ratio of front and profile not significant	fig. 157
	9. Front almost 2 times wider than profile	fig. 761
	9a. Front about 1.5 times wider than profile	fig. 982
Face/waist ratio	10. Head is much smaller	fig. 363
	11. Head approaching the width of the waist	fig. 795
	12. Head larger than waist	fig. 981
Eyes	13. No eyes	fig. 267
	14. Eyes are made using indentation technique with a small, round object	fig. 157
	15. Dash/circle eyes	fig. 212
	16. Shown by perforations	fig. 802
	17. Naturalistic eyes	fig. 937
	18. Round little dots made in eye sockets	fig. 800
Mouth	19. Dash/circle	fig. 57
	20. No	fig. 804
	21. Naturalistic	fig. 617a
Nose	22. No	fig. 217
	23. Formed by indentations from eyes (until mouth)	fig. 131
	24. Naturalistic	fig. 617a
	25. Very stylised, shaped in full face	fig. 906
Ears	26. No	fig. 717
	28. Naturalistic	fig. 709
Chin	29. No	fig. 706a
	31. Naturalistic	fig. 710
Hair, hats, hairpins	32. No hair	fig. 804
	33. Naturalistic hair	fig. 665
	33a. Not naturalistic hair	fig. 652
	33b. Naturalistic hairless (bald)	fig. 744
	34. Hats	fig. 937
	35. Hairpins	fig. 652
	36. Elongated heads with holes	fig. 1012
Neck	39. Long neck compared to head height	fig. 981
Head perforations	41. No	fig. 760
	42. Two 'eyes'	fig. 529
	42a. One 'eye'	fig. 769
	44. Around the face	fig. 984
	45. Several in place of eyes	fig. 798
Arms/shoulders	46. Without arms and shoulders	fig. 61
	47. Arms/shoulders are depicted as cone-shaped applications	fig. 798
	48. Arms/shoulders are depicted as barely visible oval applications	fig. 638
	49. With shoulder, arms are missing	fig. 48
	50. Arms are naturally long (and depicted in a certain position)	fig. 57

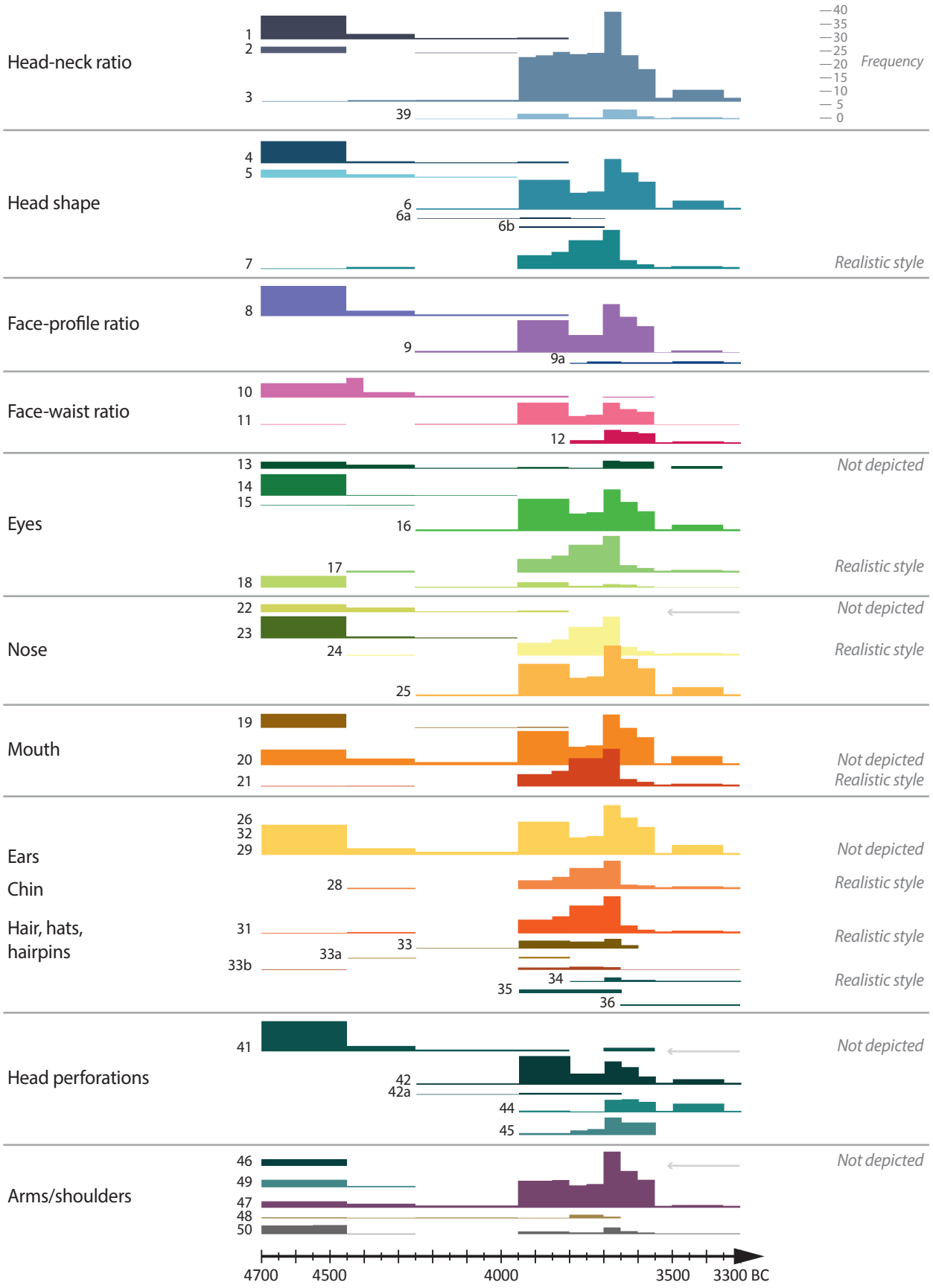

Fig. 4. Chronological distribution of stylistic characteristics of anthropomorphic Trypillia figurines.

All graphs can be divided into those that show elements depicted in a 'realistic' manner, those that have common characteristics within two chronological groups described above and others that reflect different aspects for these chronological groups.

1. *'Realistic' characteristics* include the shape of the head and parts of the face (eyes, nose, mouth, ears, chin, Fig. 4.7, 17, 21, 24, 28, 31). The specificity of chronological distribution of these elements is that they appear in small quantities already after 4700 BCE and reaching its peak in frequency between 3950 and 3550 BCE. In addition to these characteristics, five varieties of naturalistically depicted hairstyles and head accessories partially share this trend (Fig. 4.33, 33b).
2. The *common aspects* inherent in the two chronological groups highlighted above, are few. In both groups they include almost exclusively 'missing' elements of the head (Fig. 4.13, 20, 26, 29, 32, partly 41), as well as images of hands in the form of a stump short conical knobs (Fig. 4.47).
3. In contrast, the *differences* in the images of the figurines of the two chronological groups are numerous. They can be traced in the proportions of the sculpture's parts, in the methods of creating the image and in different styles of representations. Thus, in the early Trypillian figurines, the head and neck are depicted as one piece in the form of a cone or cylinder and they are shown not separated (Fig. 4.1) or are almost not separated (Fig. 4.2) from each other, in contrast to the figurines made after 3950 BCE, in which the head and neck are depicted more realistically (Fig. 4.3). Figurines of the last chronological group can also have a hypertrophied long neck (Fig. 4.39). Such large difference is also noticeable in the shape of the head (Fig. 4.4–7) and in the relationship of the face and profile (Fig. 4.8–9a). The prominence of the head and the increase in its size after 3950 BCE is also reflected in the different ratios of the width of the face and waist (Fig. 4.10–12).
   Parts of the face, such as eyes and especially nose are depicted on the overwhelming majority of sculptures. Manners and techniques of depicting the nose and eyes are closely interconnected, with the exception of the 'realistic' figurines. Thus, for the early Trypillia stages, it is typical to mold the eyes (Fig. 4.14) and nose (Fig. 4.23) simultaneously using a small object, round in cross-section. Additionally, in the centre of the eye sockets there may be a small prick (Fig. 4.18) or a stroke/notch (Fig. 4.15). On the figurines of the middle and late Trypillian period these parts of the face are molded in a completely different way. The nose is made rather stylised in the form of a large pinch on the entire face (Fig. 4.25). In order to show eyes, in this case, it was necessary to perform additional actions. In most cases, this was done by perforations (Fig. 4.16), which are completely absent for the early Trypillian figurines of the sample.
   In contrast to the nose and eyes, parts of the face such as the mouth, ears, chin, and hair were practically not depicted (Fig. 4.20, 26, 29, 32). The exception is a part of the early Trypillian figurines, where the mouth is shown (Fig. 4.19) and a part of the figurines made after 3950 BCE, which show hair, hats, and hairpins (Fig. 4.33, 33b–36).

In addition to the described difference in the depiction of the upper parts, it is necessary to emphasise the difference in the diversity (*variability*) of the representations of certain body parts. In general, we can trace different options for the design of head and body or its individual parts within both chronological periods under consideration. However, for early Trypillia, we could identify more variants of the design of the eyes and arms/shoulders. In contrast, for middle and late Trypillian figurines, more variability is observed in the display of the shape of the head, hair and related accessories, as well as perforations.

To sum up, based on the sample, it can be demonstrated in detail that Trypillian figurines can be divided into two larger chronological groups, approximately 4700–4250 and 3950–3330 BCE (with the end of the peak and some characteristics *c.* 3550 BCE). It is noteworthy that there are no intermediate characteristics between them, which indirectly refutes the possibility of 'evolution' (gradual change) of one style into another, although their coexistence is very likely. Apparently, in each of these longer periods we are dealing with the presence of a certain canon of how the figurine should have looked, and what was more obligatory to be depicted on it. Other elements are specific to each of the two periods; they could be optional (chin, ears), additional (mouth, hair, accessories), or vary greatly (arms/shoulders). The appearance of some characteristics can apparently be associated with the realistic style (*e.g.* Fig. 4.33.36). Finally, the compilation of detailed typo-chronological constructions is therefore difficult due to the long duration of existence of most elements and characteristics. However, there are exceptions that can most likely be dated more narrow (Fig. 4.35, 36, 44, 45, 46).

Ore Mountain Angels

The style of the light-bearing angels and other figures from the Ore Mountains is to a high degree determined by the most frequently chosen production technique of lathe-turning. This production technique resulted in 'radical simplification' and 'clear reduction to essential design features' (Riebel 2003, 42). The rotationally symmetrical body (so-called '*Docke*') that was subsequently modified by various reductions and additions such as wings, limbs, headdress and a colourful painting. There is a wide variability of body shapes specific to the different figure categories (Claus Leichsenring, personal communication). More rarely, the angels and other figures are carved out of wood or, in the case of smaller specimens, made out of a modelling mass in moulds (Leichsenring 1997, 81).

Poses

By far the most common are figures in a standing pose, while flying angels overall are considerably less frequent.

Size

Depending on their intended use as independent candle-holding figures or as part of scenic representations in nativity cribs or on pyramids, the figures vary considerably in size. We would like to focus here only on the category of independent candle-holding figures, which, due to series production, properties of the material (wood cracking), transportability and the size of the candles, show certain standardised dimensions (Conrad Auerbach, personal communication). The 35 figures in the sample from the collection no. 1 (from Hainichen), which show sizes between about 12 and 60 cm, give an impression of the variability in size, with percentiles between 22.60 and 30.95 cm, a mean of 27.80 cm and a median of 28 cm (Fig. 5). This sample probably reflects the size variability of figures intended for private use, in addition to which larger figures intended for public use in larger rooms, *e.g.* in churches, Christmas markets, shops and department stores, occasionally also exist.

Sculpture styles

The invention of the image of the Ore Mountains light-holding angels probably goes back to the second quarter of the 19th century (Riebel 2003, 17–22). Accordingly, the oldest known angel figures show fashion elements of the Biedermeier period *c.* 1820/1830–1850 CE (*ibid.*, 20–21). Once found, this 'Biedermeier design canon' with its characteristic fashion and various additions made of 'dough' or 'mass' (a mixture of bone glue, papier-mâché, wood flour, *etc.*) was surprisingly enduring well into the 20th century and is still active until today.

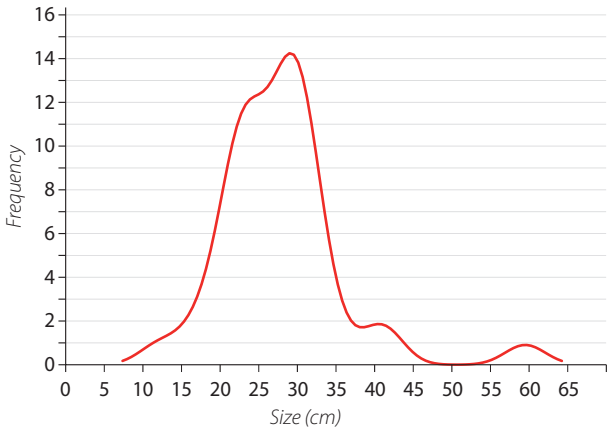

Fig. 5. Kernel density distribution of the size of Ore Mountain candle-holding figures of angels, miners and dwarfs in collection no. 1. The size analysed was not the total size of the figures, but the size of the lathe-turned Docke.

In line with the rationalisation of manufacturing processes, since the 1930s most producers have given up modelling limbs and other attachments made from mass, replacing them with lathe-turned or cut parts made of wood (Leichsenring 1997, 77). Only a very few producers have continued the traditional styles, which have since the 1990s experienced something of a renaissance (*ibid.*). Many users and manufacturers of figures generally agree that the appearance of angels should be oriented towards this 'traditional' appearance of the 19th, early 20th century.

From the 1910s, new styles of candle-bearing angels began to be established. This was accompanied by a professionalisation of the training of producers in state-sponsored craft schools (Auerbach 1995; *e.g.* Seiffen since 1853; Grünhainichen 1878) and the recruitment of external designers. Prominent examples of these trends are the angels (28er, Grünhainichener) from Wendt & Kühn (since 1915); the *Faltenrockengel* from the Blank company (since 1948), both in Grünhainichen, or the Dürrland angels from the Hillig company in Oederan (since 1996/1997). Similarly, to the very long living Biedermeier design canon, many of these creations have been produced with virtually no changes already for more than 100 years.

Motivated by efforts to create niches and to attract new user groups, today's production spectrum is characterised by a great plurality of styles, ranging from the copying of old traditional objects (*e.g.* Knut Dietze, Olbernhau), to artistic variations based on old basic forms and techniques (*e.g.* Volker Beyert, Langenau) to free artistic reinterpretations with modern, highly reduced forms and colour concepts (*e.g.* white, highly simplified objects of the 'Kunstgewerbe-Werkstätten Olbernhau GmbH').

PRODUCTION AND DISTRIBUTION

The production and style of both the Trypillian figures and the Ore Mountain sculptures are interrelated. Distribution and context are a little more difficult to assess for the modern tradition due to the lack of a mass survey of the population of at least one locality.

Trypillia 'Goddesses'

The issue of technologies for manufacturing Trypillian figurines, which is an almost obligatory element of the description of the figures, will be discussed below only in connection with selected aspects of production.

Production

It is assumed that the process of manufacturing figurines took place in close connection with production of pottery and other miniatures. This applies to mounting techniques, including the composition of the pottery mass, surface treatment, and general decorative trends (techniques and, sometimes, motifs). The production of figurines from clay masses characteristic for pottery, as well as the engobing of the surface of some sculptures, is traced for sites of different Trypillia phases (*e.g.* Ovchinnikov 2021a, 242; Ţerna and Vasilache 2019, 33).

Research shows considerable variability in figurine assemblages, including figurines from a single site, in terms of their production (*e.g.* Burdo 2013; Ovchinnokov 2021a; 2021b). This includes, for example, the coexistence of decorated and unornamented figurines, as well as figurines of very high quality and careless production. In connection with the latter, it is assumed that, on the one hand, potters could have been involved in the production of figurines (at least of higher quality), and a number of figurines could have been made by children (Starkova 2020) or apprentice potters (Ovchinnikov 2021a, 258).

Distribution

It is believed that anthropomorphic sculptures are one of the most widespread categories of Trypillian inventory after pottery and tools (Ţerna 2017, 223). Studies on the quantity of anthropomorphic sculptures relative to the area uncovered by excavations (number of figurines per 100 m^2 excavated area) showed that there is a chronological and contextual difference in its distribution (Ţerna 2017). There is also observed a difference in the number of figurines in different settlements and its almost complete absence, for example, at the sites of the 'eastern' Trypillian type (Tsvek 2006, 5). The number of such objects can also vary within sites.

Context

Regarding the context of finds, some researchers point to the dominance of finds of this type in houses (Pogoţeva 1983, 111), while others in pits (*e.g.* Ohlrau 2020, 53). Due to the poor level of publication of field documentation, counting the number of figurines for different settlement contexts is possible only for a limited number of sites.

For this study, in order to count the number of figurines per household and to assess the chronological changes in this parameter, we collected a sample of sixteen settlements of different phases, for which the number of sculptures from houses is known (Table 3). The sample included different contexts:

- houses (59),
- pits (10),
- megastructure (1),
- kiln (1),
- settlement layer (1).

Almost half of the sample is represented by data on the Talianki mega site. Ten of the 16 sites are represented by only one or two contexts. For two sites there are data on houses where figurines were not found: Ozhevo (out of four dwellings figurines were found only in one) and Talianki (out of 36 recorded houses the figurines were found in 32). The chronological distribution of the sample is extremely uneven:

- for stage A – 4 sites and 11 contexts,
- B1 – 1 site and 1 context,
- B1-B2 – 1 site and 1 context,
- B2 – 3 sites and 14 contexts,
- C1 – 7 sites and 43 contexts.

The compiled boxplot included data for houses and pits (Fig. 6). The average number of figurines per household varies from 1 to 10, but for most periods it is up to five units. Several trends can be noted in the diagram. From the periods where the sample is more representative, that is, B2 and C1, there is a tendency for the number of anthropomorphic plastic arts to decrease with the time both in households and in pits. In addition, in general, more figurines originate from pits rather than from houses. In Trypillia A, more figurines are represented, after that the maximum number of figurines gradually decreases over time. Stanislav Ţerna (2017, 238–239) also came to similar results, namely an increased amount of plastic art for the early and early middle periods, compared to the Trypillian B1-B2 and up to C1 phase, and a high rate of presence of figurines at sites where more recessed features were excavated.

Table 3 (continued next page). Frequency of anthropomorphic Trypillia figurines in houses, pits and other categories of features.

Site	Phase	Year of exc.	Context	Context simpl.	Exc. area N	Figurine no.	Source
Aleksandrovka	A		House	House		11	Pogoževa 1983, 112
Aleksandrovka	A		House	House		2	Pogoževa 1983, 112
Bernashovka	A	1972–1975	House 01	House		1	Zbenovich 1980, 129
Bernashovka	A	1972–1975	House 02	House		21	Zbenovich 1980, 129
Bernashovka	A	1972–1975	House 03	House		16	Zbenovich 1980, 129
Bernashovka	A	1972–1975	House 05	House		4	Zbenovich 1980, 129
Bily Kamin	C1	2018	Cult. layer betw. H. 07 and 08	Cult. layer		4	Burdo *et al.* in press
Bily Kamin	C1	2018	House 07	House		3	Burdo *et al.* in press
Chicherkozovka	C1	1984	House 01	House		4	Kruts *et al.* 1985, fig. 38.10–13
Dobrovody	C1	2004	House 04	House		4	Kruts *et al.* 2005, 62–63
Grenovka	A	1948	House	House		1	Pogoževa 1983, 112
Kolomyshchina 2	B2	1939	House 01	House		11	Yakubenko 2016
Kolomyshchina 2	B2	1939	House 02	House		11	Yakubenko 2016
Kolomyshchina 2	B2	1939	House 03	House		12	Yakubenko 2016
Kolomyshchina 2	B2	1939	House 04	House		7	Yakubenko 2016
Kolomyshchina 2	B2	1939	House 05	House		8	Yakubenko 2016
Kosenovka	C1-C2	2004	House 06	House		3	Kruts *et al.* 2005, 81
Luka Vrublivetska	A	1946–1950	House 01	House		4	Pogoževa 1983, 112
Luka Vrublivetska	A	1946–1950	House 02	House		84	Pogoževa 1983, 112
Luka Vrublivetska	A	1946–1950	House 03	House		20	Pogoževa 1983, 112
Luka Vrublivetska	A	1946–1950	House 05	House		60	Pogoževa 1983, 112
Maidanetske	C1	2013	House 44	House		3	Müller *et al.* 2017
Maidanetske	C1	2014	House 54	House		1	Ohlrau 2020, 99
Nebelivka	B2	2009	House A9	House		13	Burdo 2015, 29
Nebelivka	B2	2013	House B17	House		4	Burdo 2015, 29
Nebelivka	B2	2014	Kiln	Kiln		1	Burdo 2015, 29
Nebelivka	B2	2012	Mega-structure	House		10	Burdo 2015, 29
Nebelivka	B2	2013	Pit near B17	Pit		17	Burdo 2015 ,29
Nebelivka	B2	2014	Pit near kiln	Pit		28	Burdo 2015, 29
Nebelivka	B2	2013–2014	Pit S1	Pit		19	Burdo 2015, 29
Ozhevo Ostriv	B1		House 03	House		1	Chernovol 2023, 227
Ozhevo Ostriv	B1		House 04	House		0	Chernovol 2023, 227
Ozhevo Ostriv	B1		House 06	House		0	Chernovol 2023, 227
Ozhevo Ostriv	B1		House 07	House		0	Chernovol 2023, 227
Pishchana	B2	1987–1988	House 01	House		3	Kruts and Ryzhov 1988, 10 fig. 18.7–9
Pishchana	B2	2005	House 02–03	House		5	Chernovol and Ryzhov 2005, fig. 8.3–7
Sabatinovka 2	B1-B2	1947–1949	House 01	House		1	Pogoževa 1983, 112
Sabatinovka 2	B1-B2	1947–1949	House 02	House		2	Pogoževa 1983, 112
Sabatinovka 2	B1-B2	1947–1949	House 03	House		16	Pogoževa 1983, 112
Talianki	C1	1981	House 01	House	I	1	Kruts *et al.* 1982, tabl. XXIV: 2
Talianki	C1	1984	House 07–08	House	IV	1	Kruts *et al.* 1985, fig. 22.11
Talianki	C1	1985	House 09	House	IV	3	Kruts *et al.* 1986, 14 fig. XX:1–3
Talianki	C1	1985	House 10	House	IV	0	In the report no mention of figurines
Talianki	C1	1985	House 11-12	House	V	1	Kruts *et al.* 1986, 23
Talianki	C1	1988	House 16	House	VII	3	Kruts and Ryzhov 1988, 10 fig. 15.7–9
Talianki	C1	1990	House 19	House	IX	2	Kruts and Ryzhov 1991, 9 fig. 11.2–3
Talianki	C1	1991	House 20a	House	X	1	Kruts and Ryzhov 1994, 14 fig. 34.1
Talianki	C1	1994	House 24	House	XIII	3	Kruts and Ryzhov 1995
Talianki	C1	1998	House 25	House	XIII	2	Kruts *et al.* 2000, fig. 8.4
Talianki	C1	2001	House 28	House	XV	4	Kruts *et al.* 2001, 57, 59 fig. 51.1–4
Talianki	C1	2001	House 29	House	XV	2	Kruts *et al.* 2001, 57, 59 fig. 51.5,7
Talianki	C1	2001	House 30	House	XVI	2	Kruts *et al.* 2001, 57, 59 fig. 51.6,8
Talianki	C1	2001	House 31	House	XVI	1	Kruts *et al.* 2001, 57, 59 fig. 51.9

Table 3 (continuation).

Site	Phase	Year of exc.	Context	Context simpl.	Exc. area N	Figurine no.	Source
Talianki	C1	2003	House 32	House	XVI	2	Kruts *et al.* 2005, 17, 41 fig. 17.1, 2
Talianki	C1	2003	House 33	House	XVI	2	Kruts *et al.* 2005, 17, 41 fig. 17.3,4
Talianki	C1	2005	House 34	House	XV	1	Korvin-Piotrovski, Menotti, 2008, 96 fig. 10.1
Talianki	C1	2005	House 35	House	XV	0	Kruts *et al.* 2006a, 20
Talianki	C1	2006	House 36	House	XV	2	Kruts *et al.* 2006b, fig. 31.5,7
Talianki	C1	2006	House 37	House	XV	1	Kruts *et al.* 2006b, fig. 31.6
Talianki	C1	2007	House 38	House	XV	5	Korvin-Piotrovski and Menotti, 2008, 124 fig. 6.1–5
Talianki	C1	2007	House 39	House	XV	1	Korvin-Piotrovski and Menotti, 2008, 124 fig. 6.6
Talianki	C1	2008	House 40	House	XVII	3	Kruts *et al.* 2008, fig. 40.2, 4, 5
Talianki	C1	2008	House 41	House	XVII	1	Kruts *et al.* 2008, fig. 40.1
Talianki	C1	2009	House 42	House	XVIII	5	Kruts *et al.* 2009, fig. 3.3, fig. 5.1-4
Talianki	C1	2009	House 43	House	XIX	1	Own data
Talianki	C1	2010	House 44	House	XIX	2	Kruts *et al.* 2011, fig. 20.5, 6
Talianki	C1	2011	House 45	House	XX	2	Kruts *et al.* 2011, fig. 47.7; Ovchinnikov 2021a, 239 (table)
Talianki	C1	2011	House 46	House	XX	1	Kruts *et al.* 2011, fig. 49.3; Ovchinnikov 2021a, 240
Talianki	C1	2012	House 47	House	XX	1	Kruts *et al.* 2013, 83
Talianki	C1	2013–2014	House 48	House	XXI	1	Own data
Talianki	C1	2013–2014	House 49	House	XXI	0	Own data
Talianki	C1	2016–1207	House 50	House	XX	2	Ovchinnikov 2021a, 240
Talianki	C1	2017	House 51	House	XX	0	Ovchinnikov 2021b, 454, fig. 4.5
Talianki	C1	2018–2019	House 53	House	XXV	3	Ovchinnikov 2021b, 447, 448
Talianki	C1	2018–2019?	House 54	House	XXV	5	Ovchinnikov 2021b, 450, 451
Talianki	C1	2014	Kiln D	Kiln	XX	0	Ovchinnikov 2021a, 239 (tabl)
Talianki	C1	2018	Kiln G	Kiln	XXV	0	Ovchinnikov 2021b, 454-455
Talianki	C1	2002, 2004–2006	Kotlovan	Pit	XVI	9	Kruts *et al.* 2005, fig. 31.4-7, fig. 34:5; Korvin-Piotrovski and Menotti, 2008, 96 fig. 10.2; Kruts *et al.* 2006b, fig. 28.1-4
Talianki	C1	2017	Kotlovan 2	Pit	XXIII	11	Ovchinnikov 2021a, 239 (tabl)
Talianki	C1	2018–2019	Kotlovan 3	Pit	XXV	20	Ovchinnikov 2021b, 455-458
Talianki	C1		No context			1	Burdo 2010, 132, N62
Talianki	C1		No context			1	Burdo 2010, 132, N63
Talianki	C1		No context			1	Burdo 2010, 132, N66
Trinca	C1	2022	House 02	House		2	Own data

However, it is worth noting once again that our sample before B2 period is very unrepresentative. In addition, for B2 and C1 periods, the sample for pits is represented by objects (1 out of 3 for B2, and 3 out of 3 for C1) that are interpreted as parts of ceramic production complexes. If we accept the hypothesis about the connection between the production of pottery and figurines, then we can expect an inflated number of figurines for these objects.

Ore Mountain Angels

Production

The production of the Ore Mountains candle holder figures and Christmas angels began in the first half of the 19th century and was often a part of a larger production of different wooden goods. The production is often associated with the decline of regional mining and the compensation for the subsequent loss of income. Until today, a significant part of the production is carried out decentrally by families of producers in household production (Bilz 1988; Riebel 2003), who also obtain part of their income from other sources, such as agricultural work. Frequently, the distribution of the products was carried out by retailers or is now partly organised in cooperatives or in direct selling.

In the 19th-century angel figures were still being produced in relatively small numbers for use during Christmas period in the narrower Ore Mountains area and traded on local markets (Riebel 2003, 22). The figures became more and more attractive to a wider audience, also beyond the Ore Mountains, and were produced in larger number, especially in the centres of toy production such as Grünhainichen, Olbernhau und Seiffen, from the last quarter of the 19th cen-

tury (Flade 1992). The increasing mass production led to changes in the relations of production such as the establishment of manufactories. Aside from the large production centres, there are still numerous small producers who make small series of Christmas candle holder figures as a seasonal activity.

Distribution

There can be defined different zones of distribution of candle-holding Christmas figures: As part of the regional identity, in the upper Ore Mountains, the zone of origin of the Christmas traditions associated with these figures, today practically every household use several such objects. In the interviews, it became clear that, depending on the owner's motivation, collections of 10–40 such angels are more the rule than an exception. Although also widely used as Christmas decorations and collector's items, such figures are considerably less common outside the Ore Mountains and are only used in certain households, often with personal relationships in the region of production.

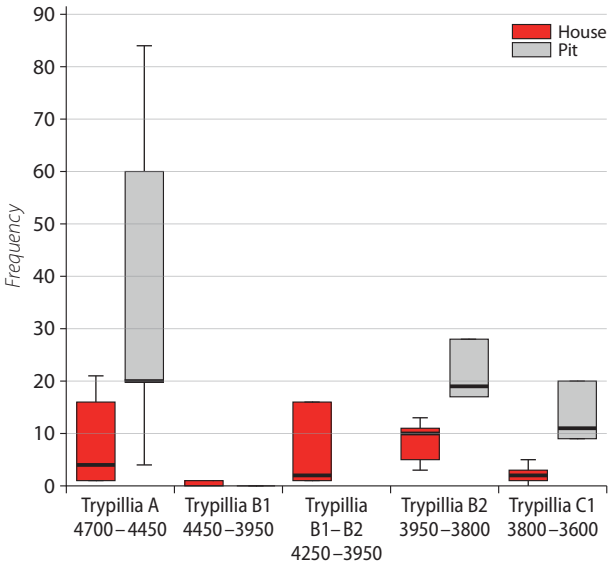

Fig. 6. Number of anthropomorphic figurines in houses and pits of Trypillia settlements over time.

DISCUSSION

The issues of interpretation of Chalcolithic anthropomorphic sculpture, including Trypillian, have become the subject of numerous studies (*e.g.* Bibikov 1953; Bailey 2000; Chapman 2000; Burdo 2004; Hansen 2007; Țerna 2008; Palaguta 2013a, 2013b; Bánffy 2017; Țerna and Vasilache 2019). Recently, there has been a shift in research from understanding figurines as objects of adoration to considering the social aspects of these representations. The meaning of the Ore Mountain sculptures has been described in detail in specialised literature (*e.g.* Blechschmidt 1995; Riebel 2003), but conversations with users and producers have shown an even more diverse picture than might be expected.

In this section, we will continue the discussion of ancient and modern sculptures, taking a closer look at their structural similarities, the parameters for determining the functions of the objects, and observations regarding their real or possible meaning.

Structural similarities

The examination of some aspects of the Trypillian figurines and sculptures of the 'angel' class from the Ore Mountains has shown that despite all the differences, there are significant *structural similarities* between them:

1. Both groups of sculptures are *part of larger complexes of figurative art and related objects*. In the case of the prehistoric ceramic miniatures, this applies for example to animal figurines, sledges and house models. The Ore Mountain candlestick holders are part of a wide range of wooden figures with different contents. It is noteworthy that the different figurative representations in Trypillia are often not analysed jointly. By contrast, the Ore Mountains angels are seen by their producers and users *a priori* as an integral part of one and the same tradition.
   It is important to note that the different categories of the aforementioned sculptures from the Ore Mountains, even if we only consider figures of the same size class as candle holding 'angels' — miners and '*Räuchermänner*' (*e.g.* Turks) — often do not have iconographic connections in the sense that they depict different characters interacting with each other in the same story. Each category has its own origins and history of association with other categories of figures, which modern users do not think about or are simply unaware of.
2. *Manufacturing.* Style of the sculptures and production methods are strongly interconnected with each other for both the modern and prehistoric sculptures discussed here. The producers of 'angels' can also produce other similar inventory or sculptures, which is also assumed for the Trypillian figures. And, just like that in both contexts, firstly, the creation of sculptures is assumed not to be the only activity of the producers, and secondly, the participation of children or pupils in the pro-

duction process is considered to be possible. It is worth mentioning separately that for the producers of wooden sculptures of the Ore Mountains there is partly a fuzzy boundary between the producers and the consumers. This is because making the figures is seen as part of maintaining a tradition that contributes significantly to one's identity.

3. *Distribution*. For both contexts, wide distribution in some zones and limited distribution in others is traced. Thus, in the Ore Mountains region, according to the collected data, angels and similar objects are present in practically every house, and outside this region they are much less common, only in some households. In Trypillia, there are sites where there are more figurines in houses, there are sites where they are fewer, and there are sites where they are absent. In principle, if we take Trypillia B2 and C1 periods and the well-studied region of mega sites (Sinyukha River Basin), then figurines are present there in almost all excavated houses.[8] This contrasts with the presence of plastic art at earlier and later sites in the same region (see *e.g.* Tsvek 2006; Kushtan 2015).
4. *Number of sculptures per household*: In the upper Ore Mountains, the centre of Christmas tradition with candle holding figures, today every household has at least several of these objects. For Trypillia, the number is more difficult to estimate, since it is not entirely clear in what conditions the houses were left. The potential number of sculptures per household could correlate with data from houses and pits. While the record from houses are interpreted as 'snapshots', the record from pits might represent 'durable archives' deposited during the entire lifespan of houses (Țerna 2021). However, there are not much such data available. In the best-represented periods Trypillia B2 and C1, fewer than 10 figurines were usually found in a house, while 10–30 figurines were found in a pit. Considering the nature of these archives, as explained above, this implies that a significant number of figurines were disposed as waste in pits, by analogies in other contexts (*e.g.* Bánffy 2017).
5. *Styles*. One of the most striking structural similarities is the almost unwavering adherence to certain canons of depicting figurine details over longer periods of time.
6. For both cultural contexts, a small *group of large sculptures* stands out.
7. Finally, the *content* of the figurines is quite ambiguous. On the one hand, through the prism of the cognitive map of today's world, we see primarily the 'female' image of these sculptures. However, the analysis of Trypillian figurines showed that only some of them show clear depictions of gender. Similar, although the sculptures of 'angels' depict a female image, by definition they do not have a gender. The attitude of users and producers towards these sculptures, although portraited as female, is respectful with an emphasis on the content of an 'angel' rather than a 'woman'.

The presence of structural similarities allows us to proceed with parallel consideration of these representations, namely their *use* and *meaning*. Moving on to the discussion of these questions, it is worth noting that, in contrast to the statistically substantiated observations in the sections above, the data on Trypillian figurines is significantly inferior to the information about 'angels'. Many of the assumptions made about the use of plastic art in prehistory are difficult to prove.

Usage

Trypillia

Some parameters on the basis of which it possible to interpret the functions of anthropomorphic figurines are outlined below.

Site context

The figurines come mainly from settlements, and, as the data show (see Table 3), they were found almost in every house, with rare exceptions (Ozhevo, Maidanetske). Thus, we cannot consider these objects to be an 'exclusive' inventory. Our data confirms other observation that in average more figurines are found in pits than in houses, although, apparently, there are single cases where more sculptures are associated with the houses than with pits (*e.g.* Țerna and Vasilache 2019).

For the final Trypillian period (3650–3000 BCE), the use of figurines is documented mainly as grave goods in children's burials (*e.g.* Patakova 1970; Dergachev and Manzura 1991; Manzura 2014; 2016). This also applies to figurines of the Serezlievka type in contemporaneous burial mounds in the northern Pontic steppe, which are associated either with children's graves or collective graves with children (Rassamakin 2021). However, it is unclear to what extent this connection between figurines and children can also be applied to earlier figurine assemblages from settlements.

8 The Maidanetske site looks like a strange exception against this background (Ohlrau 2020, 40–43).

Feature context

In houses, according to Aina Pogoževa's data, figurines are found in very different places, in connection with which she suggested that the functions of the sculptures could include protecting the house (including the entrance and the stove), the inhabitants of the house, possibly food, as well as mediation between people and the deity (Pogoževa 1983, 114). That is, according to this model, the figurines could be used as a talisman, cult object, or multifunctional item.

In most cases, figurines were distributed over different parts of settlement items such as houses or mega-structures (Chapman *et al.* 2018) rather than concentrated in one place. Probably they are not found in deposits at the place of their use, but rather represent waste in secondary positions. However, sets of figurines have been found at some sites (Palaguta 2013b; Țerna 2013, 203–205). Ilia Palaguta believes that such sets of figurines, as they could have represented one hierarchically organised group of characters, could have been used in rituals related to communication with ancestors, and/or be included in initiation rites and fortune-telling practices.

Installation in place

For some figurines, including those depicted in the steatopygian manner or with a massive flat leg, standing or semi-sitting (sometimes in a chair) positions are assumed. Some figurines show vertical voids in the legs, which indicate the possibility of putting them on rods. These vertical voids are also frequently found in south-east Europe. They appear to be reinforcements to stabilise the figurine (*e.g.* Hofmann and Hofmann 2012–2013). Such items are represented by only a few examples and date back to the Early Trypillia period (Pogoževa 1983, 129). For figures with a pointed lower end, it is not clear whether they are standing or lying. It cannot be ruled out that they were hanging or were stuck into the ground.

Morphology and décor

Figurines were often interpreted within the theory about the cult of the female image associated with the idea of fertility also due to their morphology and decorations (*e.g.* Pogoževa 1983, 111; Burdo 2001, 92; Ovchinnikov 2014, 167–168). The fairly standard clothing and hairstyle of the figurines are interpreted by Aina Pogoževa and Natalia Burdo as ritual or ceremonial female clothing and hairstyle associated with a magical fertility ritual (Pogoževa 1983, 125–128; Burdo 2010).

In contrast, our analysis shows that, in terms of quantification, we are dealing with a more limited number of female images with clearly defined primary gender attributions. More than 70 % of the images do not have an emphasised depiction of gender. This result goes hand in hand with similar studies for South-Eastern and Central Europe, as well as with the long-standing, but still not fully accepted, criticism of the 'great goddess' narrative (*e.g.* Meskell 1995; Bailey 2000; Hansen 2007; Nanoglou 2010; Palaguta 2017; Gleser *et al.* 2019).

As it can be seen, the use of figurines was *ordinary*, they are present in almost every house. They were deposited like other waste after use or wear, and were also sensitive to some cultural changes (*e.g.* historical, technological, related to ceramic production, *etc.*). It is worth noting separately the developments towards greater realism of figures and their increased sizes (see Shatilo and Hofmann 2024).

The connection of figurines with children's burials looks tempting. However, it is observed in the post-'mega site' time of global restructuring and transformations of the entire way of life and material culture (see *e.g.* Müller *et al.* 2016 and 2018). For the Chalcolithic of South-Eastern Europe, the connection of plastic art with burials was traced for the Lower Danube region in the 5th millennium BCE, where, however, they occur in graves of all age groups, *e.g.* in Durankulak (Vajsov 2002; Bánffy 2017).

Ore Mountains

Our interview partners largely agreed that the angels and other figures from the Ore Mountains are primarily used as seasonal carriers of light (candles or electric lamps) in Christmas traditions, and thus as decorations to create a 'beautiful atmosphere' with light during the 'dark season'. The interviewees ruled out a religious meaning for themselves, but did not want to completely rule it out for others. Although some of the interviewees partly use the figures throughout the year, they are usually not visibly stored outside of the Christmas season and are only taken out at the beginning of the Christmas season (waking up or *'Männlwecken'*). They are used mostly for private purposes, but are increasingly being partly showcased in a representative way in the windows for public viewing. Nowadays, the purchase and display of new figures is often associated with the birth of children (an angel for girls and a miner for boys). By passing them on to the next generation as a gift or inheritance, some figures fulfil commemorative functions related to their previous owners. Some large specimens are intended for public exhibition in churches, shops or outdoor areas *e.g.,* on large pyramids in the public space of villages or towns.

Meaning

Trypillia

For understanding the hypothetical meaning of the figurines, several observations should be mentioned:

Distribution. Anthropomorphic plastic art is characteristic, with some exceptions, for the majority of Trypillian sites, including the Cucuteni part of the settlement network, and for many other archaeological cultures of the Neo-Chalcolithic in South-eastern Europe (see *e.g.* Bailey 2000; Hansen 2007; Bánffy 2017). It is possible to note a generally more frequent occurrence of figurines in Trypillian households than on some Balkan sites (Hofmann and Hofmann 2012–2013). Trypillian plastic art is a part of a certain cultural set, for example, together with richly decorated fine ware and adobe houses.

Stylistic variability. The analysis (see Fig. 4) showed that we can talk about at least two fairly stable styles within the entire array of Trypillian sculptures — early and late. Based on the sample, we cannot talk about the 'evolution' of one style into another; rather, we are dealing with a replacement. Within these styles, certain morphological elements are quite stable and do not change much. At the same time, there are certain chronological and regional variations (*e.g.* Vykhvatinska or Kaniv groups, Pogoževa 1985, 233–234, fig. 981–987; Ovchinnikov 2014), which, however, generally correlate with the style of the corresponding period.

Utilisation. Figurines found in pits heavily outnumber the findings in houses which indicates that after fulfilling their functions, or as a result of wear, these objects were disposed. These observations may indicate the availability, not exclusivity, of the figurines, the details of the image of which were maintained with minor deviations over long periods of time. Emphatically or unintentionally, they formed an integral part of the culture and its traditions.

Considering the content of the figures, Douglass Bailey believes that they reflect a generalised image of a person, not a deity (Bailey 2000, 101–103). Indeed, the elements of the figurines are quite consistent with the human body,[9] in contrast to some images on Trypillian ceramics (*e.g.* Monah 2016, fig. 266). That is, today, based on how the figurines look, they cannot be indisputably associated with mythical images.

Douglass Bailey interprets the figurines of South-eastern Europe, including the Trypillian ones, as a *means of constant maintenance of identity*. Svend Hansen emphasises the generality of the image of the figurines (the rejection of everything individual), fidelity to the tradition of the image and that the use of them possibly varies from region to region. He believes that a concrete description of the religious worldview of early farmers based on figurines is impossible (Hansen 2007, 395).

Ore Mountains

At least in the narrower catchment area of the Ore Mountains and also in other parts of the state of Saxony, the production and use of the entire complex of figurative art of the Ore Mountains is highly *identity-forming*. Certainly, demonstrating belonging to this cultural environment is one of the most important motivations behind the use of these objects. Although angels from the Ore Mountains undoubtedly have a thematic connection to the role of angels in the Christian Christmas story (*e.g.* Annunciation, Birth and Baptism of Jesus Christ), they are primarily used to create the ambience for a festivity that is also very central in social terms for the family cohesion.

CONCLUSIONS

The conducted research was aimed at analysing possible functions and meanings of Trypillian figurines, as well as understanding their place in Trypillian society. In search of alternative explanations, we turned to modern sculptures of angels. This was also done in order to show how objects of this kind can function in practice and how such a tradition operates. The choice of sculptures from the Ore Mountains was not accidental: While studying these objects, we came to the conclusion that there were some structural similarities between them and the Trypillian figurines.

Based on observations on angels, an alternative explanation could be proposed that in other societies, including the ones of the Trypillian complex, the importance of such objects may have been slightly *overemphasised*. Indeed, angels play a role in a certain 'ritual complex', but they are not cult objects, and their 'importance' works differently. In addition to their practical value, their significance lies, among other things, in the users' *self-identification* within their cultural and social system. Similar models, with an emphasis on figurines as a means of identification, are now being offered for prehistoric sculptures.

9 In this sense, only the figurines with one eye stand out.

The comparison of Trypillia figurines with the Ore Mountain sculptures also showed that the choice of the characters can have different bases or origins, and initially different categories (*e.g.* angels, miners, Turks) have no fundamental justification for common use. Only over time can a 'myth' be created why they are belonging and used together. The case of angels from the Ore mountains shows that factors of *randomness or accident* can play a role in the creation of specific figure assemblages. It is interesting to note how, despite constant changes in fashion, the way to depict costumes from the time the figure type was invented is retained and reproduced again and again.

It is also worth mentioning the *mechanisms* of maintaining traditions. In practice, new figurines are created by copying old models. Users acquire these items not only to express involvement in 'their group' (regional/religious) or cultural context, and to maintain memory (of, for example, deceased ancestors who used these items), but also out of a desire of *conformity* within a society. And of course, very important factor intertwined with all of the above is the often *symbolic entrainment* that users feel towards these things.

The interest in angels varies throughout a person's life, or differences between different members of the same family. People who, due to their age or character, reflect more on the past (traditions and/or family) are more involved in this tradition.

Wooden sculptures of the Ore Mountains, despite the fact that they do not represent religious inventory, are used respectfully. It is noteworthy that none of the respondents confirmed that they can throw away such objects as they wear out, although in practice we did not see old objects that are undoubtedly thrown away when they wear out.

Angels, like other objects of art, through the process of their development (for example, changes in styles) can indirectly *reflect historical changes* that affect the conditions of production, for example, the transformations of the early 20th century CE, the revival of 'old norms (styles)' after the collapse of the German Democratic Republic. In this sense, it is surely no mere coincidence that the high importance of the entire 'tradition complex' in the Ore Mountains and elsewhere, is growing just nowadays, in a critical time, when people seem to have given up hope for a better life in the future and are instead turning to the supposedly better 'good old days' (Baumann 2017). Most likely, this is also true for Trypillia, where we observe stylistic changes synchronously to the formation of highly populated aggregated settlements with ring-shape layouts and the fading of the late style, with an accompanying large-scale reduction in the production and use of plastic art with the fall of this system.

Of particular importance are the observations concerning the appearance of large-sized figures in Trypillia settlements coinciding with the formation of enormous population aggregations and specific socio-political constellations in Trypillia mega-sites (see Shatilo and Hofmann 2024). In the Ore Mountains, large figures, unlike the many small ones, are not intended for private use in the domestic context but for public usage. It is worth noting that especially such large figures have found their way as public objects at Christmas markets and department stores far more regularly beyond the borders of the Ore Mountains than the smaller objects.

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REFERENCES

Auerbach, K., 1995. Zur Entwicklung der Spielwarenschule Seiffen. *In:* K. Auerbach, ed. *Idee Zeichnung Produkt. Die Spielwarenschule Seiffen von ihren Anfängen bis zur Gegenwart. Dem 100. Geburtstag von Max Schanz gewidmet.* Seiffen: Erzgbirgisches Spielzeugmuseum Seiffen, 3–19.

Bailey, D.W., 2000. *Balkan Prehistory: Exclusion, Incorporation and Identity*. London: Routledge.

Bánffy, E., 2017. Neolithic Eastern and Central Europe. *In:* T. Insoll, ed. *The Oxford Handbook of prehistoric figurines*. New York: Oxford University Press, 709–728.

Baumann, Z., 2017. *Retrotopia*, Edition Suhrkamp. Berlin: Suhrkamp Verlag.

Bibikov 1953: Бибиков, С.Н. *Раннетрипольское поселение Лука-Врублевецкая на Днестре: К истории ранних земледельческо-скотоводческих племен на юго-востоке Европы*, Материалы и исследования по археологии СССР 38. Москва, Ленинград: Академия наук СССР.

Bilz, H., 1988. *Die gesellschaftliche Stellung und soziale Lage der hausindustriellen Seiffener Spielzeugmacher im 19. und Anfang des 20. Jahrhunderts*, Schriftenreihe des Erzgebirgischen Spielzeugmuseums des Kurorts Seiffen 2. Seiffen: Verlag "Sächsische Heimatblätter'.

Blechschmidt, M., 1995. *Engel & Bergmann. Weihnachten im Erzgebirge*. Husum: Husum Druck- und Verlagsgesellschaft mbH u. Co. KG.

Burdo 2001: Бурдо, Н.Б. Теракота трипільської культури. *In:* С.М. Рижов, Н.Б. Бурдо, М.Ю. Відейко and Б.В. Магомедов, eds. *Давня кераміка України. Археологічні джерела та реконструкції. Частина перша*. Київ: Національна академія наук України, Інститут археології, 61–146.

Burdo 2004: Бурдо, Н.Б. Сакральний світ трипільської цивілізації. *In:* М.Ю. Відейко, ed. *Енциклопедія трипільської цивілізації I*. Київ: Укрполіграфмедіа, 344–419.

Burdo 2010: Бурдо, Н.Б. Реалистическая пластика Триполья–Кукутень: систематизация, типология, интерпретация. *Stratum plus* 2, 123–168.

Burdo 2011: Бурдо, Н.Б. Антропоморфна пластика з трипільського поселення Майданецьке. *Археологія* 2, 3–16.

Burdo 2013: Бурдо, Н.Б. *Реалистическая пластика культурного комплекса Триполье-Кукутень. Систематизация, типология, интерпретация*. Saarbrücken: LAP LAMBERT Academic Publishing.

Burdo 2014: Бурдо Н.Б. Антропоморфні фігурки трипільського поселення Небелівка. *In: Колекції наукових фондів Институту археології НАН України, Результати досліджень*. Археологія і давня історія України 1(12), 79–83.

Burdo 2015: Бурдо, Н.Б. Антропоморфна пластика з Небелівки. *In: Інститут археології НАН України, На східній межі старої Європи. Матеріали міжнародної наукової конференції, Кіровоград, Небелівка, 12–14 травня 2015 року*. Кіровоград: ТОВ «Імекс-ЛТД», 29–32.

Burdo, N., Rud, V. and Hofmann, R., in press. Miniature ceramic items from Trypillia settlements of South-East Podillia. *In:* R. Hofmann, W. Kirleis, J. Müller, V. Rud, S. Ţerna and M. Videiko, eds. *From Ros to Prut: Transformations of Trypillia Settlements* II. Leiden: Sidestone Press, 131–156.

Chapman, J., 2000. *Fragmentation in archaeology. People, places and broken objects in the prehistory of south- eastern Europe*. London: Routledge.

Chapman, J., Gaydarska, B., Nebbia, M., Millard, A., Albert, B., Hale, D., Woolston-Houshold, M., Johnston, S., Caswell, E., Arroyo-Kalin, M., Kaikkonen, T., Roe, J., Boyce, A., Craig, O., Orton, D.C., Hosking, K., Rainsford-Betts, G., Nottingham, J., Miller, D., Arbeiter, S., Shevchenko, N., Pashkevytch, G., Rud, V., Videiko, M.Y., Burdo, N. and Krementski, K., 2018. GEOINFORM Ukrainii (2018) *Trypillia mega-sites of the Ukraine [data-set]*. York: Archaeology Data Service [distributor]. https://doi.org/10.5284/1047599 2018)

Chernovol and Ryzhov 2005: Черновол, Д.К. and Рижов, С.М. *Звіт Піщанського загону Трипільської експедиції за 2005 рік с. Піщана Тальнівського району Черкаської області*. Київ: Науковий архів Інституту археології Національної академії наук України, № 2005/135.

Chernovol 2023: Черновол, Д.К. До питання великих споруд трипільської культури. *Археологія і давня історія України* 1, 222–232.

Dergachev and Manzura 1991: Дергачев, В.А. and Манзура, И.В. *Погребальные комплексы позднего Триполья*. Кишинев: Штиинца.

Flade, H., 1992. *Seiffener Spielzeug. Volkskunst aus dem Erzgebirge*. Dresden: Verlag der Kunst.

Girnik and Videiko 1989: Гірник І.П. and Відейко М.Ю. Антропоморфна пластика з трипільського поселення біля с. Чичиркозівка Черкаської області. *Археологія* 1, 83–90.

Gleser, R., Becker, V. and Thomas, M., 2019. Remarks on representations of men in the southeastern European Neolithic and Chalcolithic (Drama, I 522). *In:* T. Vulchev, ed. *Studia In Honorem Iliae Iliev*, Vesti na Jambolskija Muzei 6(9). Yambol: Regionalen istoričeski muzej, 82–101.

Gusev 1995: Гусєв С.О. *Трипільська культура Середнього Побужжя рубежу IV–III тис. до н. е.* Вінниця: Антекс.

Gusev 2009: Гусев, С.О. Антропоморфна пластика середньобузької локальної горупи трипільської культури (етап В1–ВІІ – СІ). *In:* С.А. Васильев, Л.В. Кулаковская, eds. *С.Н. Бибиков и первобытная археология*, Санкт-Петербург: ИИМК РАН, 310–322.

Hansen, S., 2000. Die Plastik der Jungstein- und Kupferzeit in Ostungarn. *Das Altertum* 46, 97–132.

Hansen, S., 2007. *Bilder vom Menschen der Steinzeit. Untersuchungen zur anthropomorphen Plastik der Jungsteinzeit und Kupferzeit in Südosteuropa*, Archäologie in Eurasien 20. Mainz: Philipp von Zabern.

Hofmann, R. and Hofmann, A., 2012–2013. Anthropomorphe und zoomorphe Figurinen des Spätneolithikums aus Okolište und der Butmirgruppe in Zentralbosnien: Darstellungsmodi, Herstellungstechniken, Datierungen, Häufigkeiten und Fundkontexte. *Offa* 69–70, 439–459.

Korvin-Piotrovsky and Menotti 2008: Корвин-Пиотровский, А. and Меноттi, Ф., eds. *Трипольская культура в Украине. Поселение-гигант Тальянки*. Киев: Національна академія наук України, Інститут археології.

Kruts 1977: Круц, В.А. Позднетрипольские памятники Среднего Поднепровья. Киев: Наукова думка.

Kruts *et al.* 1982: Круц, В.А., Рыжов, С.Н., Збенович, В.Г., Шумова, В.А. *Отчет о работе тальянковского отряда Трипольской экспедиции за 1981 г.* Науковий архів Інституту археології Національної академії наук України, ф. е., 1981/11б.

Kruts *et al.* 1985: Круц, В.А., Рыжов, С.Н., Шумова, В.А. and Салий, Н.Г. *Отчет о работе Тальянковского отряда Трипольской экспедиции в 1984 г.* Науковий архів Інституту археології Національної академії наук України, ф. е., 1985/23е.

Kruts *et al.* 1986: Круц, В.А., Рыжов, С.Н. and Клочко, В.И. *Отчет о работе Трипольской экспедиции (Тальянковский отряд) в 1985 г.* Науковий архів Інституту археології Національної академії наук України, ф. е., 1985/23е

Kruts *et al.* 2000: Круц, В.А., Рыжов, С.Н., Корвин-Пиотровский, А.Г. and Чабанюк, В.В. *Отчет о работе Трипольской экспедиции за 1998–1999 гг.* Науковий архів Інституту археології Національної академії наук України, ф. е., 1999/97.

Kruts *et al.* 2001: Круц В.А., Корвин-Пиотровский А.Г. and Рыжов С.Н. *Трипольское поселение-гигант Тальянки. Исследования 2001 г.* Киев: ИА НАНУ.

Kruts *et al.* 2005: Круц, В.А. Корвин-Пиотровский, А.Г., Рыжов, С.Н., Бузян, Г.Н., Овчинников, Э.В., Черновол, Д.К. and Чабанюк, В.В., 2005. *Исследование поселений-гигантов трипольской культуры в 2002–2004 гг.* Киев: ИА НАНУ.

Kruts *et al.* 2006a: Круц, В.А., Рыжов, С.Н., Корвин-Пиотровский, А.Г., Овчинников, Э.В., Черновол, Д.К. and Чабанюк, В.В. *Отчет о работе Трипольской экспедиции за 2005 г.* Науковий архів Науковий архів Інституту археології Національної академії наук України, ф. е., 2005/136.

Kruts *et al.* 2006b: Круц, В.А., Рыжов С.Н., Корвин-Пиотровский, А.Г., Черновол Д.К., Пичкур Е.В. and Чабанюк В.В. *Отчет о работе Трипольской экспедиции за 2006 г.* Науковий архів Інституту археології Національної академії наук України, ф. е., 2006/241.

Kruts *et al.* 2008: Круц, В.А., Корвин-Пиотровский, А.Г., Менотти, Ф., Рыжов, С.Н., Черновол, Д.К. and Чабанюк, В.В. *Трипольское поселение-гигант Тальянки. Исследования 2008 г.* Киев: ИА НАНУ.

Kruts *et al.* 2009: Круц, В.А., Корвин-Пиотровский, А.Г., Менотти, Ф., Рыжов, С.Н., Толочко, Д.В. and Чабанюк, В.В. *Трипольское поселение-гигант Тальянки. Исследования 2009 г.* Киев: ИА НАНУ.

Kruts *et al.* 2011: Круц, В.А., Корвин-Пиотровский, А.Г., Рыжов, С.Н., Черновол, Д.К. and Чабанюк, В.В., 2011. *Трипольское поселение-гигант Тальянки. Исследования 2011 г.* Киев: ИА НАНУ.

Kruts *et al.* 2013: Круц, В.А., Корвин-Пиотровский, А.Г., Чабанюк, В.В. and Шатило, Л.А. 2013. *Трипольское поселение-гигант Тальянки. Исследования 2012 г.* Киев: ИА НАНУ.

Kruts and Ryzhov 1988: Круц, В.А. and Рыжов, С.Н. *Отчет о работе Тальянковского отряда Трипольской экспедиции в 1988 г.* Науковий архів Інституту археології Національної академії наук України, ф. е., 1988/4а.

Kruts and Ryzhov 1991: Круц, В.А. and Рыжов, С.Н. *Отчет о работе Трипольской экспедиции в 1990 г.* Науковий архів Інституту археології Національної академії наук України, ф. е., 1909/7.

Kruts and Ryzhov 1994: Круц, В.А. and Рыжов, С.Н. *Отчет о работе Трипольской экспедиции в 1991–1993 гг.* Науковий архів Інституту археології Національної академії наук України, ф. е., 1993/3.

Kruts and Ryzhov 1995: Круц, В.А. and Рыжов, С.Н. *Отчет о работе Трипольской экспедиции за 1994 г.* Науковий архів Інституту археології Національної академії наук України, ф. е., 1994/3.

Kushtan 2015 Куштан, Д. Керамічний комплекс пізньотрипільського поселення Шарин III. *Культурний комплекс Кукутень-Трипілля та його сусіди. Збірка наукових праць пам'яті Володимира Круца*. Львів: «Астролябія», 429–439.

Leichsenring, C., 1997. *Massefiguren aus dem Erzgebirge*, Reihe WEISS-GRÜN 14. Dresden: Sächsisches Druck- und Verlagshaus GmbH.

Mantu, C.-M., Dumitroaia, G. and Tsaravopoulos, A., 1997. *Cucuteni. The Last Great Chalcolithic Civilization of Europe. Archaeological Museum of Thessaloniki, 21 September – 31 December 1997.* Bucharest: Athena Publishing.

Manzura 2014: Манзура, И.В. Некоторые аспекты социальной организации носителей позднетрипольской культуры (по материалам Выхватинского могильника). *In:* P.M. Мунчаев, ed. *Древние культуры Юго-Восточной Европы и Западной Азии. Сборник к 90-летию со дня рождения и памяти Н.Я. Мерперта*. Москва: IA RAN, 93–123.

Manzura 2016: Манзура, И.В. Могильник Маяки как источник по социальной организации носителей усатовской культуры. *In:* L. Sîrbu, N. Telnov, L. Ciobanu, G. Sîrbu and M. Kaşuba, eds. *Culturi, procese şi contexte în arheologie. Volum omagial Oleg Levițki la 60 de ani*. Chişinău: Culturi, procese şi contexte în arheologie, 310—330.

Markevich 1981: Маркевич, В.И. *Познетрипольские племена Северной Молдавии*. Кишинев: «Штиинца».

Meskell, L., 1995. Goddesses, Gimbutas and "New Age"archaeology. *Antiquity* 89, 74–86.

Mischka, D., 2004. Aoristische Analyse in der Archäologie. *Archäologische Informationen* 27, 233–243.

Monah, D., 1997. *Plastica antropomorfă a culturii Cucuteni-Tripolie, Bibl. MA III*. Piatra-Neamț: Constantin Matasă.

Monah, D., 2016. Antropomorphic Representations in the Cucuteni-Trypillia Culture. Oxford: Archaeopress.

Movsha 1973: Мовша, Т.Г. Нові дані про антропоморфну реалістичну пластику Трипілля. *Археологія* 11, 3–21.

Müller, J., Rassmann, K. and Videiko, M., 2016. *Trypilla Mega-Sites and European Prehistory 4100–3400 BCE*. Themes in Contemporary Archaeology 2. London: Routledge.

Müller, J., Hofmann, R., Kirleis, W., Dreibrodt, S., Ohlrau, R., Brandtstetter, L., Dal Corso, M., Rassmann, K., Burdo, N. and Videiko, M.Y., 2017. *Maidanetske 2013 – New excavations at a Trypillia mega-site*, Studien zur Archäologie in Ostmitteleuropa 16. Bonn: Habelt.

Müller, J., Hofmann, R., Ohlrau, R. and Shatilo, L., 2018. The social constitution and political organsiation of Trypillia mega-sites: hierarchy and balance. *In:* H. Meller, D. Gronenborn and R. Risch, eds. *Überschuss ohne Staat – Politische Formen in der Vorgeschichte. Surplus without the State – Political Forms in Prehistory,* Tagungen des Landesmuseums für Vorgeschichte Halle 18. Halle (Saale): Landesamt für Denkmalpflege und Archäologie Sachsen-Anhalt – Landesmuseum für Vorgeschichte Halle (Saale), 247–260.

Nanoglou, S., 2010. The representation of phalli in Neolithic Thessaly, Greece. *Documenta Praehistorica* XXXVII, 215–225.

Ohlrau, R., 2020. *Maidanets'ke: Development and Decline of a Trypillia "Mega-site" in Central Ukraine*, Scales of Transformation in Prehistoric and Archaic Societies 7. Leiden: Sidestone University Press.

Ovchinnikov 2014: Овчинников, Е.В. *Трипільська культура Канівського Подніпров'я*. Київ: Видавець Олег Філюк.

Ovchinnikov 2021a: Овчинников, Е.В. Пластика з трипільського поселення-гіганта Тальянки (комплекс "Сім'я гончаря 1", розкопки 2011–2017 рр.). *Археологія і давня історія України* 2, 237–260.

Ovchinnikov 2021b: Ovchinnikov, E.V. Пластика из комплекса «семья гончара-2» на трипольском поселении-гиганте Тальянки. *In:* A.S. Djačenko, J.J. Rassamakin, T.K. Harper and I. Sobkowiak-Tabaka, eds. *Data systematization in the neo-eneolithic of southeastern and central Europe: Essays in honor of Sergej Ryzhov*. Kyiv: Institute of Archaeology of the National Academy of Sciences of Ukraine, 445–469.

Palaguta 2013a: Палагута, И.В. Первобытное общество в зеркале искусства: новый взгляд на интерпретацию антропоморфной пластики эпохи неолита. Вестник Санкт-Петербургского университета. *Искусствоведение* 15(2), 128–146.

Palaguta 2013b: Палагута И.В. Наборы статуэток Прекукутени – раннего Триполья: опыт социокультурной интерпретации раннетрипольской пластики. *Российский Археологический Ежегодник* 3, 141–179, 208–211.

Palaguta 2017: Палагута, И.В. Антропоморфная пластика неолита – медного века Европы: проблемы и перспективы исследования. *In:* Л.Б. Вишняцкий, ed. *Ex Ungue Leonem: Сборник статей к 90-летию Льва Самуиловича Клейна*. СПб.: Нестор-История, 179–200.

Panofsky, E., 1939. *Studies in Iconology: Humanistic Themes in the Art of the Renaissance*. New York: Oxford University Press.

Patakova 1970: Патокова, Э.Ф. *Усатовское поселение и могильники*. Киев: Наукова думка.

Pogoževa 1983: Погожева, А.П. *Антропоморфная пластика Триполья*. Новосибирск: Наука.

Pogoževa, A.P., 1985. Die Statuetten der Trypillia-Kultur. *Beiträge zur allgemeinen und vergleichenden Archäologie* 7, 95–242.

Rassamakin 2021: Рассамакін, Ю.Я. Статуетки серезліївського типу як фактор контактів за доби пізнього енеоліту. *Археологія і давня історія України* 39(2), 338–349.

Riebel, J., 2003. *Erzgebirgische Weihnachtsfiguren. Gedrechselte Lichterfiguren, Räuchermämmer und Nussknacker. Geschichte – Motive – Hersteller 19. und Anfang 20. Jahrhundert*, Reihe WEISS-GRÜN 32. Chemnitz: Verlag Klaus Gumnior.

Shatilo and Hofmann 2021 Шатіло, Л.О. and Хофманн, Р. Зображуючи трипілля: поява та занепад реалістичного стилю. *Археологія і давня історія України* 39(2), 198–221.

Shatilo, L. and Hofmann, R., 2024. Depicting Trypillia: the emergence and transformation of the realistic style. *In:* J. Müller, W. Kirleis and N. Taylor, eds. *Perspectives on Socio-environmental Transformations in Ancient Europe*. Cham: Springer, 221–256.

Shmagliy 2001: Шмаглій, М. Великі трипільські поселення і проблема ранніх форм урбанізації. К.

Starkova 2020: Старкова, Е.Г. Статуэтки трипольской культуры из Немирова: новые материалы из старой коллекции. *Camera praehistorica* 1(4), 93–108.

Tsvek 2006: Цвек, О.В. *Поселення східнотрипільської культури (короткий нарис)*. Київ: Інститут археології Національної академії наук України.

Țerna, S., 2008. Probleme actuale în interpretarea statuetelor antropomorfe Cucute-niene. *Revista Arheologică* 4(2), 33–39.

Țerna 2013: Церна, С. Интерпретация трипольской пластики. Комментарии (Палагута И.В. 2013. Наборы статуэток Прекукутени – раннего Триполья: опыт социокультурной интерпретации раннетрипольской пластики). *Российский Археологический Ежегодник* 3, 200–211.

Țerna 2017: Церна, С. К вопросу о распространении мелкой антропоморфной пластики на поселениях культуры Кукутень-Триполье. *Краткие сообщения Института археологии (КСИА)* 247, 223–244.

Țerna, S., 2021. How can we investigate the socio-economic structure of the Cucuteni-Tripolye mega-sites? Houses as Snapshots and Pits as Durable Narratives. *Archäologisches Korrespondenzblatt* 51(1), 37–60.

Țerna, S. and Vasilache, M., 2019. *Anthropomorphic figurines from Cucuteni A stage from the Prut-Dniester interfluves: (the collections of the National Museum of History of Moldova)*, Biblioteca Tyragetia 31. Chișinău: Muzeul Național de Istorie a Moldovei.

Țerna, S., Vornicu-Țerna, A., Hofmann, R., Dal Corso, M., Shatilo, L., Vasilache-Curoșu, M., Rud, V., Knapp, H., Kirleis, W. Rassmann, K. and Müller, J., 2019. Stolniceni – Excavation results from the 2017 campaign. *Journal of Neolithic Archaeology* 21, 209–281.

Vajsov, I., 2002. Die Idole aus den Gräberfelder von Durankulak. *In:* H. Todorova, ed. *Durankulak II, Die prähistorischen Gräberfelder*. Berlin: Publishing House Anubis, 257–266.

Yakubenko 2011: Якубенко, О.О. Антропоморфна пластика трипільського поселення Володимирівка. *In:* Н.Г. Ковтанюк, ed. *Тематичний збірник наукових праць*. Київ: Такі справи, 56–80.

Yakubenko 2015: Якубенко, О. Антропоморфна пластика з пізньотрипільських поселень у с. Жванець. *In:* В.С. Травінський, ed. *Збірник матеріалів археологія & фортифікація України. V Всеукраїнська науково-практична конференція приурочена 125-й річниці заснування Кам'янець-Подільського державного історичного музею-заповідника*. Кам'янець-Подільський: ТОВ «Друкарня Рута», 22–31.

Yakubenko 2016: Якубенко, О. Антропоморфна пластика з трипільського поселення Коломийщина II. *In:* Б.К. Патриляк, ed. *Науковий вісник Національного музею історії України*, Київ: Національний музей історії України, 18–31.

Zbenovich 1980: Збенович, В.Г. *Поселение Бернашевка на Днестре (к происхождению трипольской культуры)*. Киев: Наукова думка.

Ritual Knowledge, Power and Inequality

Stephen Shennan

KEYWORDS: *inequality, ritual property, cultural transmission, 'enchanted universe'*

Abstract

The aim of this paper is to argue that ritual knowledge has been under-rated as a source of social inequality, defined as 'those differences that are imposed on individuals (or classes of individuals) by structural features of a social system' (Smith *et al.* 2023, 1). Far from being a mere means of legitimation of power based on material foundations it can itself be the foundation from which material power flows. After reviewing some evidence of the importance of ritual knowledge as property I link its importance to Marshall Sahlins's (2022) argument that, until recently at least, most people lived in what he has called an 'enchanted universe'. In this context, power differentials and social inequality can exist in societies that lack the material distinctions usually associated with them. In developing this proposal, I then return to an argument I first made many years ago (Shennan 1996) about the importance of ritual knowledge and cultural transmission in the creation of inequality in hunter-gatherer societies, before reviewing more recent work on this topic and concluding.

Zusammenfassung

In diesem Beitrag wird argumentiert, dass rituelles Wissen als Quelle sozialer Ungleichheit — definiert als „jene Unterschiede, die Individuen (oder Klassen von Individuen) durch strukturelle Merkmale eines sozialen Systems auferlegt werden" — unterschätzt wird (Smith et al. *2023, 1). Weit davon entfernt, ein bloßes Mittel zur Legitimation von Macht zu sein, die auf materiellen Grundlagen beruht, kann sie selbst die Grundlage sein, aus der sich materielle Macht speist. Nachdem einige Belege für die Bedeutung von rituellem Wissen als Eigentum aufgezeigt werden, wird dies mit Marshall Sahlins (2022) Argument in Verbindung gebracht, dass zumindest bis vor kurzem die meisten Menschen in einem, wie er es nannte, „verzauberten Universum" lebten. In diesem Zusammenhang können Machtunterschiede und soziale Ungleichheit auch in Gesellschaften bestehen, in denen es keine materiellen Unterscheidungen gibt, die normalerweise mit ihnen verbunden sind. Im vorliegenden Beitrag wird ein Argument aufgegriffen, das bereits vor vielen Jahren von mir vorgebracht wurde (Shennan 1996). Damals wurde die Bedeutung von rituellem Wissen und kultureller Überlieferung für die Entstehung von Ungleichheit in Jäger- und Sammlergesellschaften thematisiert. Im Folgenden wird ein Überblick über neuere Arbeiten zu diesem Thema gegeben, bevor die Ausführungen abschließend diskutiert werden.*

INTRODUCTION

In their well-known *Science* paper Monique Borgerhoff-Mulder *et al.* (2009) identified three different types of wealth, embodied, relational and material, with different properties and with differing propensities for enabling inter-generational wealth transmission and the growing wealth inequality through time that results. The distinctions they made have been profoundly influential on subsequent studies. What has not been noted is that they also identified another form of wealth — ritual knowledge — but felt unable to pursue it: 'We have no measures of other heritable determinants of well-being such as ritual knowledge, an important source of institutionalized inequality in some populations' (*ibid.*, 685). Ritual knowledge

is sometimes dismissed as a source of inequality because it is a 'non-rival good' in the jargon, my having it does not exclude your having it. Nevertheless, it is excludable, if I keep it secret or charge for access, which is often the case for ritual knowledge just as it is for scientific journals or Netflix access (in the jargon it is a 'club good'). Indeed, in the 21st century intellectual property is more valuable than any other.

But intellectual property is not a concept restricted to modern societies with patent systems. Robert Lowie (1947, 235–243) provides a long list of examples of 'incorporeal property' for which the owners had to be recompensed in some way if other people wanted to use them, or which were hereditary privileges of specific groups. Like Robert Lowie, Simon Harrison (1992) argues that ritual functioned as a form of intellectual property in many traditional societies, in a way analogous to prestige goods: they are immaterial and material forms of prestige values that can be a basis for inequality. Thus,

"*Even in societies such as those of pre-colonial Melanesia, where everyone has equal access to their means of livelihood and a similar standard of living, there are often very real inequalities of property in culture and cosmology, in art, magic, mythology and ritual.*"

(Harrison 1992, 235)

He points to the case of the Trobriand Islands, described by Bronisław Malinowski, where the senior sub-clan owed their position to their ownership of the strongest magic. Spells could also be inherited but their transfer required significant material transfers to a man's mother's brother. Such payments could include material prestige goods, such as stone axe blades.

"*The production and consumption of intellectual property function in the maintenance of rank or prestige, in the formation of alliances and patronage networks. Rights in magic, in dances, in rituals, or in the designs of masks or statuary seem therefore to be treated often as intellectual prestige goods, and to form part of special high-status or ceremonial spheres of exchange.*"

(*ibid.*, 234)

Lamont Lindstrom (1984) has a similar argument to the effect that in those societies where inequality is based on control of knowledge it is this that provides the basis for structuring society, rather than simply legitimating inequality based on material resources. It is kept secret and is a focus of political competition. From a very different starting point, in comparative intellectual property law, Mark Suchman too (Suchman 1989) arrives at a position not dissimilar to those of Simon Harrison and Lamont Lindstrom, also citing examples of the acquisition of immaterial magical items through exchanges for material goods. He adds the important point that legitimate magic owners can protect their rights by using accusations of witchcraft against competitors to their position, with severe sanctions.

The key point though about such immaterial objects is that they only exist by virtue of mutual agreement that they do:

'*They presuppose a shared universe of information and meaning, and depend upon that universe not only for their value, but for their very reality.*"

(Harrison 1992, 234–235; cf. also Bloch 2012)

But in the worlds where they do exist they matter. These worlds correspond to what Marshall Sahlins (2022) in his final book calls the 'enchanted universe'.

"*Until they are transformed by the colonial transmissions of the axial ideologies, Christianity notably, peoples (that is most of humanity) are surrounded by a host of spiritual beings — gods, ancestors, the indwelling souls of plants and animals, and others. These lesser and greater gods effectively create human culture; they are immanent in human existence and for better or worse determined human fate, even unto life and death. Although generally called 'spirits', these beings themselves have the essential attributes of persons, a core of the same mental, temperamental and volitional capacities… By this same quality they interact with human persons to form one big society of cosmic dimensions – of which humans are a small and dependent part.*"

(Sahlins 2022, 2–3)

This is why we need to take ritual knowledge and its ownership and deployment seriously: the 'cosmic host' forms the foundation of human existence.

The examples provided by Robert Lowie, Simon Harrison and Mark Suchman, some of which have been described above, demonstrate the importance of ritual knowledge as intellectual property that can be transferred and inherited, nor should an insistence on recognising its role be seen as incompatible with the other forms of wealth (Borgerhoff-Mulder *et al.* 2009) describe. On the contrary, there are likely to have been many forms of interaction between them. However, the standard view has been that ritual legitimises material differences or economic inequalities when, Simon Harrison (1992) suggests, the situation may really be the reverse, the economic inequalities justify the ritual privileges and distinctions. In fact, a recent comparative phylogenetic study of the relation between religious and political authority in Austronesian societies (Sheehan *et al.* 2023) found a reciprocal relationship between the two in virtually all the societies

included in the analysis, even in those that only possessed sub-local levels of authority, nor was there any indication that one or the other was causally prior. In keeping with this, they "*did not find any evidence for long-term patterns of differentiation or fusion in systems of religious and political authority*" (*ibid.*, 40).

HUNTER-GATHERER INEQUALITY

In keeping with the previous discussion, the next part of the paper will try to bring up to date a paper I published more than 25 years ago that made similar points (Shennan 1996). In that paper I tried to show, following the work of James Woodburn (*e.g.* Woodburn 1982) and others on the distinction between immediate-return and delayed-return hunters and gatherers, that many if not most forager societies are not as egalitarian as traditionally assumed (cf. also Flanagan 1989, Paynter 1989). The traditional view derived from a belief that inequality must be based on differential access to material resources, of which most foragers, for good reasons, possess little, or to food, which is largely shared and thus again provides no basis for inequality. Of course, the assumption of forager egalitarianism also depended on the long-standing belief that foragers could be regarded as the baseline of human social organization, from which subsequent social 'complexity' developed. This tendency for such societies to be seen as a rhetorical antithesis to our own reached its apogee in the representation of the !Kung/Ju/'hoansi Bushmen as a totally egalitarian society without any forms of institutionalized leadership and with a powerful ethic of sharing. Such 'immediate-return' societies in Woodburn's terms featured not just immediate consumption and distribution of food but also the existence of social levelling mechanisms and a lack of long-term rights over other people. Christopher Boehm (*e.g.* Boehm 1993) took such hunter-gatherers as universal and argued that, in contrast to our non-human primate relations, hunter-gatherers were characterised by 'reverse-dominance hierarchies' in which a strong anti-dominance ethic prevailed. Specifically, he proposed that adult males give up their individual possibilities of domination over others in order to be certain that no one may dominate them, and thus those egalitarian political arrangements derive not from special ecological or social structural circumstances but from moral sanctions.

When studies acknowledge the existence of hierarchically organized forager societies, as they now increasingly do, they generally account for these in terms of ecologically specific possibilities for the control of wild subsistence resources that are predictable and excludable, like fishing sites (*e.g.* Smith and Codding 2021). While the relevance of such resources is undeniable, the assumption that they are the only resources that matter, I argued, arises from the view that material disparities are the only significant ones, so the lack of concern with them on the part of most foragers, combined with the importance of food-sharing, means that they must be egalitarian. Such arguments neglect the fact that that inequalities in access to ritual knowledge of the kind described above also exist in foraging societies. In many such societies the transmission of ritual knowledge, and control over it through initiation and other rites, is one of the main social focuses of the people concerned. In fact, the control of such knowledge is often the only legitimate locus for the generation of inequality among the members of forager societies. Furthermore, in some contexts such control is actually hereditary, again in complete contrast to what are usually asserted as the key characteristics of forager societies.

Examples of the link between ritual and inequality in forager societies are widespread. Thus, Fred Myers (1988), in a discussion of Pintupi land 'ownership' in Australia, argued that 'ownership' is control over stories, objects and ritual associated with mythological ancestors at a particular place, and because such knowledge is highly valued and vital to social reproduction men seek to gain it and be associated with its display and transmission. But even among those claiming identity with a particular place only a certain number control the relevant rituals and decide whether particular individuals should be 'taught', a privilege easily granted to close kin but not necessarily to others:

"*With its origin in the Dreaming, "country" constitutes a form of valued knowledge that is esoteric, transmitted […] to younger men, but restricted in access".*

(Myers 1988, 67)

Similarly, Robert Layton (1986) pointed out that in delayed-return Aboriginal societies important sources of power included access to sacred sites and ritual knowledge associated with property-holding corporate lineages, even though those lineages did not have exclusive control of food resources, while the acquisition of religious knowledge was a source of prestige. He concluded,

"*Where exclusive rights in territories and their food resources, or geographical sites and sacred knowledge, are vested in lineages, the opportunity for inegalitarian structures exists".*

(Layton 1986, 30)

Even among the Hadza, one of his archetypal 'immediate-return' societies, without the corporate lineages existing in Australia, James Woodburn notes,

"*the initiated men's group maintains important privileges over certain joints of meat of large game animals. These privileges are linked with exclusive possession of secret sacred knowledge and ritual to which all women and young men are denied access.*"

(Woodburn 1988, 21)

The same point can be made in relation to the foragers of the North American Great Basin. As described by Julian Steward (*e.g.* Steward 1936; Steward 1938), they are generally regarded as one of the classic egalitarian societies. However, David Whitley (1994) presented a different view. Not only was there inequality between men and women, but also among men, in particular between those who were shamans, and thus had access to supernatural power, and those who did not. Village and band headmen were almost always shamans, and shamanism, like headship, was largely hereditary:

"*It was only through the acquisition of shamanistic power that men could truly become political actors and gain prestige and status in Numic society. In turn, this advantaged them in a number of ways: women desired such men as preferred marriage partners, and the population at large respected them, largely out of fear of their potentially malevolent [power]. And, in that shamanistic power was partly inherited, but in any case limited to a small segment of the population (estimated at about 2%), it is apparent that a very restricted, incipient elite group, comprised of shaman/headmen, existed within the ostensibly egalitarian Numic society.*"

(Whitley 1994, 366–367)

A related argument was developed at length by David Riches (1992) in his discussion of the role and significance of shamanism. In his account, the success or failure of hunters is seen as depending on the community's relations with the spirit world and maintaining these in good order depends on the observation of taboos. The shaman is the mediator between these two worlds and has responsibility for the cultural evaluation process in terms of which some actions are regarded as taboo. The skills are passed on from expert to novice through an apprenticeship. As a result of his mediating position with the spirit world, or better, we should now say, with the 'metahuman' world, the shaman has power, privileges and position which are unavailable to anyone else. They have a key role in determining what are approved and disapproved modes of behaviour, and in transmitting these and the cultural framework on which they are based.

Writing around the same time as David Whitley and David Riches, Ron Brunton (1989) contrasted the kind of situation described in the previous section, in which there is a strong association between the transmission of ritual knowledge and relations of authority, with the observed cultural instability of certain tropical forest egalitarian foraging societies. This arose, he argued, because of the structural nature of genuine egalitarianism, since it can never provide a basis for ensuring a correct version or interpretation of that which is communicated. Any attempt to distinguish what is valuable from what is not requires an act of evaluation, which in itself implies inequality:

"*To the extent that evaluation, and exclusion on the basis of evaluation, takes place, egalitarianism is compromised. To the extent that egalitarianism is thoroughgoing, such cultures can be little more than heaps of randomly associated elements, whose persistence is always fortuitous.*" (Brunton 1989, 678)

On this view, egalitarianism can only be maintained by according little value to cultural products, which indeed accounts for the general indifference to such products in the egalitarian societies Brunton discusses. In delayed-return systems on the other hand, as we have seen,

"*intergenerational inequality, as well as inequality between household heads in terms of power, wealth and status are commonly present.*" (*ibid.*, 674)

These circumstances not only presuppose social group continuity, they are also closely linked with cultural continuity in ritual and other spheres since, as we have seen, ritual knowledge and its transmission is often the locus of inequality, and strong cultural evaluation takes place.

Subsequently, perhaps the person who has most emphasised the role of ritual and ritual knowledge as a source of power is Brian Hayden, in his discussions of what he calls transegalitarian societies and the role of 'secret societies' within them (Owens and Hayden 1997; Hayden 2018a, 2018b), where secret societies are

"*voluntary, ranked, ritual associations whose memberships, or at least the upper ranks of memberships, were exclusive and who typically claimed to possess ritual knowledge of great value to their own members or knowledge which could be used for the benefit of others, usually at a cost [...]. In order to obtain access to the ritual knowledge held by high-ranking members, initiates characteristically paid high admission and advancement fees involving wealth payments and feasts given to the society.*" (Hayden 2018b, 119)

Hayden's argument, however, is the opposite of that proposed here. First, as is apparent from his phrase 'claimed to possess' he regards the ritual knowledge simply as a basis for the cynical manipulation of other members of the group. Second, he sees the manipulators as aggressive 'aggrandizing' individuals, of whom there are always some in every society, who attempt to seek power over others. My proposal, in contrast, in keeping with Simon Harrison (1992), is that we should take the significance of the ritual knowledge to the people concerned, including the upper ranks of these societies, seriously. Otherwise, how could it be a source of power and provide a basis for 'terrorizing' communities in some cases? This does not stop his list of common features of secret societies from being extremely useful if we want to identify their existence in specific times and places, as archaeologists. They include:

- Esoteric knowledge, including astronomical knowledge
- Use of costumes and masks *e.g.* to impersonate spirits
- Use of musical instruments like flutes to indicate the presence of spirits
- Animal iconography focussed on powerful or mythical animals
- Initiations in secluded places involving extreme experiences
- Use of materials from distant sources in society ritual activities (Hayden 2018b)

Brian Hayden makes a strong case for the idea that Upper Palaeolithic cave art, for example, reflects the activities of such secret societies. Both hunter-gatherers and farmers/horticulturalists can fall into Hayden's transegalitarian category but in either case, he argues, the full development of secret societies depends on the existence of some form of material wealth, required to finance the payments or feasts needed to enter the higher grades, and, according to Hayden, provide the real motivation for them.

Robert Layton (2018, table 7.1) shows that many of the characteristics of such secret societies can be found in Aboriginal Australia. They include esoteric knowledge as the 'key resource held by senior men and women' who pass it on to initiates, ritual sites with distinctive rock art, animal iconography in body painting and rock art identifying totemic beings, as well as the occurrence of 'ecstatic states'. In fact, according to Layton, the acquisition of more religious knowledge than one's contemporaries 'was the most common route towards differences in power … [and generated] respect and even fear'. On the other hand, the payments and feasts are not found because they depend on the ability to produce reliable surpluses, which the unpredictable ecology does not support.

Douglas Bird *et al.* (2019) take a very similar perspective to Layton in the course of their argument that forager groups do not live in small-scale societies. The 'estates' of Australian Aboriginal groups are spatially defined complexes of ritual knowledge, material culture and places ('spatially explicit storehouses of ritual and relational wealth') owned by groups that have exclusive rights to them, passed on through the generations, but individuals can be initiated into multiple estates so that they are linked to members of other estates in an unbounded network represented by the so-called 'songlines' and thus have access to their sacred knowledge. "*The estate system … is a delayed-return ritual economy defined in a network of relational wealth*" (Bird *et al.* 2019, 102).

In the case of the well-known hunter-fisher-gatherer groups of the Pacific north-west coast of North America the existence of marked social inequality and restricted rights to important material resources is well-established but the goal of the wealth competition for which the region is famous was to obtain ritual titles and privileges (Harrison 1992, 236–237). Jeanne Arnold *et al.* (2016) make similar points about the California coast Chumash forager groups. While chiefs here certainly had privileged access to material resources such as plank-built canoes:

"*Esoteric intellectual property and ritual gear were of great importance, and chiefs' control of supernatural knowledge was crucial given that success or failure was directly linked to [their] relative knowledge and use of power […]. Their work to maintain the operation of the world meant that it would never revert to luck or chance.*" (Arnold *et al.* 2016, 468)

From a comparative cultural evolutionary perspective some recent studies have come to similar conclusions about ritual knowledge and inequality. Thus, Zachary Garfield *et al.* (2020; cf. Winkelman 2021) in their comparative cross-cultural study of universal and variable dimensions of leadership in human societies, identify shamanism, by which they mean generically leadership involving supernatural qualities, as a 'distinct form of leadership' based on both a capacity to induce fear and knowledge and expertise. These come together because the knowledge and expertise relate to what the authors refer to as the 'supernatural' but which we can better see, as per Sahlins, as relating to their interactions, often in the form of ceremonial displays, with 'the cosmic host of beings and forces [that] comprise an all-around substrate of human action'.

CONCLUSION

Ritual knowledge in many societies has the characteristics of intellectual property in that it can be owned by particular groups, it can be obtained by exchange for material goods and services, it can be the object of social competition and it can be passed on through generations. It also plays a central social role. For these reasons it can provide a basis for social inequality in hunter-gatherer and horticultural societies when material distinctions are absent, where inequality refers to

"*those differences that are imposed on individuals (or classes of individuals) by structural features of a social system.*" (Smith *et al.* 2023, 1)

Even though he takes a diametrically opposite view of what is going on, Brian Hayden (2018) shows some of the ways we might recognise the importance of ritual knowledge and its control in the archaeological record. We may be more ready to accept its importance in the 21st century because of the growing acknowledgement that we need to attach importance to indigenous understandings and categorisations of people's worlds if we are to improve our own understanding of them. In fact, in Marshall Sahlins's (2022) recent argument, hierarchical cosmologies are present in human societies from the very beginning because they reflect the powerful cosmic forces that govern people's lives. In the 'enchanted universe' they provided not the superstructure but the infrastructure of all social power, or as Marshall Sahlins put it:

"*With apologies to all the human scientists, Marxists, Durkheimians, and others implicitly grounded in the assumptions of a transcendentalist world, the immanentist cultures were subject to 'determination by the religious basis' […].*" (Sahlins 2022, 3)

The implication of this is that even if we can justify the use of measures like the Gini coefficient to describe material inequality, they will potentially tell us little about how inequality actually worked in the societies concerned.

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REFERENCES

Arnold, J.E., Sunell, S., Nigra, B.T., Bishop, K.J., Jones, T. and Bongers, J., 2016. Entrenched Disbelief: Complex Hunter-Gatherers and the Case for Inclusive Cultural Evolutionary Thinking. *Journal of Archaeological Method and Theory* 23, 448–499.

Bird, D.W., Bird, R.B., Codding, B.F. and Zeanah, D.W., 2019. Variability in the organization and size of hunter-gatherer groups: Foragers do not live in small-scale societies. *Journal of Human Evolution* 131, 96–108.

Bloch, M., 2012. *Anthropology and the Cognitive Challenge*. Cambridge: Cambridge University Press.

Boehm, C., 1993. Egalitarian behaviour and reverse dominance hierarchy. *Current Anthropology* 34, 227–254.

Borgerhoff Mulder, M., Bowles, S., Hertz, T., Bell, A., Beise, J., Clark, G., Fazzio, I., Gurven, M., Hill, K., Hooper, P.L., Irons, W., Kaplan, H., Leonetti, D., Low, B., Marlowe, F., McElreath, R., Naidu, S., Nolin, D., Piraino, P., Quinlan, R., Schniter, E., Sear, R., Shenk, M., Smith, E.A., von Rueden, C. and Wiessner, P., 2009. Intergenerational wealth transmission and the dynamics of inequality in small-scale societies. *Science* 326(5953), 682–688. doi: 10.1126/science.1178336

Brunton, R., 1989. The cultural instability of egalitarian societies. *Man* (n.s.) 24, 673–681.

Flanagan, J., 1989. Hierarchy in simple "egalitarian" societies. *Annual Review of Anthropology* 18, 245–266.

Garfield, Z.H., Syme, K.L., Hagen, E., 2020. Universal and variable leadership dimensions across human societies. *Evolution and Human Behavior* 41, 397–414.

Harrison, S., 1992. Ritual as Intellectual Property. *Man* (n.s.) 27(2), 225–244.

Hayden, B., 2018a. *The Power of Ritual in Prehistory*. Cambridge: Cambridge University Press.

Hayden, B., 2018b. Did secret societies create inequalities in the Upper Palaeolithic? *In: Moreau 2018*, 117–130.

Layton, R., 1986. Political and Territorial Structures Among Hunter-Gatherers. *Man* (n.s.) 21(1), 18–33.

Layton, R., 2018. Adaptation and cumulative processes in human prehistory. *In: Moreau 2018*, 103–116.

Lindstrom, L., 1984. Doctor, Lawyer, Wise Man, Priest: Big-Men and Knowledge in Melanesia. *Man* (n.s.) 19(2), 291–309.

Lowie, R., 1947. (originally published 1920). *Primitive Society*. New York: Liveright Publishing Corporation.

Moreau, L., ed., 2018. *Social inequality before farming? Multidisciplinary approaches to the study of social organization in prehistoric and ethnographic hunter-gatherer-fisher societies*. Cambridge: McDonald Institute for Archaeological Research.

Myers, F., 1988. Burning the truck and holding the country: property, time and the negotiation of identity among Pintupi Aborigines. *In*: T. Ingold, D. Riches, J. Woodburn, eds. *Hunters and Gatherers, Volume 2: Property, Power and Ideology*. Oxford: Berg, 52–74.

Owens, D. and Hayden, B., 1997. Prehistoric Rites of Passage: A Comparative Study of Transegalitarian Hunter–Gatherers. *Journal of Anthropological Archaeology* 16, 121–161.

Paynter, R., 1989. The archaeology of equality and inequality. *Annual Review of Anthropology* 18, 369–399.

Riches, D., 1992. Shamanism: the key to religion. *Man* (n.s.) 29, 381–405.

Sahlins, M., 2022. *The New Science of the Enchanted Universe: An Anthropology of Most of Humanity*. Princeton: Princeton University Press.

Sheehan, O., Watts, J., Gray, R.D., Bulbulia, J., Claessens, S., Ringen, E.J. and Atkinson, Q.D., 2023. Coevolution of religious and political authority in Austronesian societies. *Nature Human Behaviour* 7, 38–45.

Shennan, S., 1996. Social inequality and the transmission of cultural traditions in forager societies. *In*: J. Steele and S.J. Shennan, eds. *The Archaeology of Human Ancestry: Power, Sex and Tradition*. London: Routledge, 365–379.

Smith, E.A. and Codding B., 2021. Ecological variation and institutionalized inequality in hunter-gatherer societies. *Proceedings of the National Academy of Sciences USA* 118 (13), e2016134118.

Smith, E.A., Smith, J.E. and Codding, B.F., 2023. Toward an evolutionary ecology of (in)equality. *Philosophical Transactions of the Royal Society B* 378, 20220287. https://doi.org/10.1098/rstb.2022.0287

Steward, J.H., 1936. Shoshoni polyandry. *American Anthropologist* 38, 561–564.

Steward, J.H., 1938. *Basin Plateau Aboriginal sociopolitical groups*, Smithsonian institution Bureau of American Ethnology Bulletin 120. Washington DC: Bureau of American Ethnology.

Suchman, M.C., 1989. Invention and Ritual: Notes on the Interrelation of Magic and Intellectual Property in Preliterate Societies. *Columbia Law Review* 89(6), 1264–1294.

Whitley, D., 1994. By the hunter, for the gatherer: art, social relations and subsistence change in the prehistoric Great Basin. *World Archaeology* 25, 356–373.

Winkelman, M.J., 2021. A cross-cultural study of the elementary forms of religious life: shamanistic healers, priests, and witches. *Religion, Brain & Behavior* 11(1), 27–45.

Woodburn, J., 1982. Egalitarian societies. *Man* (n.s.) 17, 431–451.

Woodburn, J., 1988. African hunter-gatherer social organisation: is it best understood as a product of encapsulation? *In*: T. Ingold, D. Riches and J. Woodburn, eds. *Hunters and Gatherers, Volume 1: History, Evolution and Social Change*. Oxford: Berg, 31–64.

Haunted by or Drowning in Data
Reflections from the Bronze Age Tell of Százhalombatta, Hungary

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KEYWORDS: *qualitative, unique, Bronze Age, tell settlement*

Abstract

Using the experience of analysing the material from the Bronze Age tell of Százhalombatta, Hungary, this paper reflects on the challenge of an abundance of data. The volume of finds from the tell enables statistic and volumetric comparisons, identification of patterns, and tracing changes over the settlement's lifetime. The data vastly advances our ability to provide a coherent, evidence-based argument about how the site 'functioned', the organization of tasks and spaces, and the slow changes in its material outputs (especially pottery). However, the richness of data means that the emerging insights tend to be biased towards that which can lead to patterns, and, therefore, limited to repetitive practices and expressions. In this paper, we aim to consider what kind of aspects get lost because there is so much. How does the singular, the unique and the one-off become part of the story of the tell – and does it matter if they are left out of the account?

Zusammenfassung

Anhand der Erfahrungen, die bei der Analyse des Materials aus dem bronzezeitlichen Tell von Százhalombatta, Ungarn, gemacht wurden, reflektiert dieser Beitrag die Herausforderung einer Fülle von Daten. Der Fundreichtum des Tells ermöglicht statistische und volumetrische Vergleiche, die Identifizierung von Mustern und die Verfolgung von Veränderungen im Laufe der Siedlungsgeschichte. Die Daten ermöglichen es uns, ein kohärentes, evidenzbasiertes Argument über die Funktionsweise des Ortes, die Organisation von Aufgaben und Räumen und die langsamen Veränderungen in der materiellen Produktion (insbesondere Keramik) zu liefern. Die Fülle der Daten bedeutet jedoch, dass die sich daraus ergebenden Einsichten tendenziell auf das ausgerichtet sind, was zu Mustern führen kann, und daher auf sich wiederholende Praktiken und Ausdrücke beschränkt sind. In diesem Beitrag wollen wir untersuchen, welche Aspekte in der Fülle der Daten verloren gehen. Wie werden das Einzigartige, das Unverwechselbare und das Einmalige Teil der Erzählung – und spielt es eine Rolle, wenn sie in der Darstellung ausgelassen werden?

INTRODUCTION

Using the experience of analysing the material from the Bronze Age tell of Százhalombatta, Hungary, this paper reflects on the challenge of an abundance of data. We do this in recognition of Johannes's long insistence on the power of data and his willingness to recognize diverse forms of data and work out methods to engage with them. He has steadily reminded us that as archaeologists we must engage with evidence, but also that this is not always a straightforward task.

With increasingly refined excavation methods, including sieving and flotation, and the application of ever more detailed scientific analyses and with them demands for new kinds of samples, such as for soil micromorphology, aDNA, and eDNA, the data arising from modern excavation and surveys has exploded. As a result, the synthesis of single sites and, of course, even more so regions or particular materials (such as ceramics), is becoming a considerable challenge (for

an example of the increase in regional data in England over the last three decades see Evans *et al.* 2023). The obvious response is systematization, ensuring that archaeological observations are transformed into usable and useful data. To enable comparison, more standardization of data, records, and interpretations is needed. Explorations of how generative AI can help in the management and analysis of this data seem an obvious development as accounting for our rich data is becoming a very strenuous and costly enterprise. Using the example of the excavation of the Bronze Age tell at Százhalombatta, Hungary, this paper aims to raise questions about those bits of pieces from a past community that do not fit in with such approaches.

The volume of finds and other data from the Százhalombatta tell enables statistical and volumetric comparisons within the site, identifying patterns and tracing changes over the settlement's lifetime. The large data set vastly advances our ability to provide coherent, evidence-based arguments about how the site 'functioned' in terms of the organization of tasks and spaces. It also enables the characterization of both the slow changes in the objects made and used by the occupants of the tell (especially pottery characteristics) and ruptures of the rhythms of life on the site, especially through alterations of spatial layout (Sofaer *et al.* 2020; Vicze and Sørensen 2023). However, and this is the concern of the following reflections, the richness of data also means that the emerging insights tend to be biased towards that which can lead to patterns. It will, therefore, be circumscribed by evidence produced by repetitive practices and expressions, including those resulting from site formation processes in themselves. Here we, therefore, aim to consider what kind of aspects or insights can get lost because there is so much of something, but not of everything. How does the singular, the unique and the one-off become part of the story of the tell — and does it matter if they are left out of the account? The challenge is captured in the common phrase about not being able to see the forest for the tree or the tree for the forest, suggesting that sometimes it would be useful to combine a mixture of perspectives or gazes.

INTRODUCING SZÁZHALOMBATTA-FÖLDVÁR, HUNGARY

Százhalombatta-Földvár is one of a series of fortified Bronze Age tell settlements found on the western bank of the Danube, some 30 km south of Budapest. The site is located on a natural loess promontory approximately 160 m high with a very steep bank along the river. Overlooking both the wide river and the flat rolling land to the east, it was in viewing distance to other tell settlements to the north and south along the Danube as well as non-tell sites in the wider environs. The site was enclosed by a combination of natural creeks and cut ditches.

Chronologically the tell starts in the Early Bronze Age (BA) and runs through the Middle Bronze Age to be abandoned at its end. Its *c.* 5 m-thick stratigraphy comprises of 20+ levels with an unknown number still to be uncovered in the remaining 1 m currently being excavated. In traditional culture-historical terms the lower levels (yet to be excavated) represent the so-called Nagyrév Culture while the younger ones belong to the Vatya Cultural complex. In absolute chronology it covers a period between *c.* 2500 and 1450 BCE.

There have been several earlier smaller excavations (see Vicze and Sørensen 2023 for the site history) but the material discussed here is from the SAX project, an excavation project that began in 1999 and is still ongoing. This project is excavating a 20 x 20 metres trench. A digital recording system has been used throughout and the site is being excavated using a single-context approach (for the history of the different stages of this campaign see Poroszlai-Vicze 2000; Poroszlai-Vicze 2005; Vicze *et al.* 2017; Sørensen *et al.* 2020, Vicze and Sørensen 2023). The recording and collection strategy is elaborate and systematic, including dry sieving of all excavated materials, measuring the volume of soils from every unit excavated, 10 l of soil taken for various samples from each excavation unit, and a separation of the finds material into Bulk Finds and Point Provenance finds (PP finds). The latter refers to any find that is deemed to be able to provide distinct information, for example on function, import, or date; these finds are given 3-D point provenance in the digital recording system. The Bulk Finds refers to the rest of the material; it is collected and recorded by excavation unit and contains information on the material (bone, ceramic, daub, stone, *etc.*), number, and weight, with further specialist analysis adding more variables, such as fabric for ceramic. The site was divided into a metric grid and recorded through ids (identification numbers); ids were allocated either to an excavation unit within the grid (2 x 2 m or 1 x 1 m depending on the character of the deposit, typically a layer) or to special features, such as floors, hearths, pits, and working surfaces (Vicze 2005). All excavated material was linked to an id, which was then recorded using a digital recording system (Intrasis). This means that every single recovered find can be associated either with an excavation unit or a single feature, making it possible to investigate both horizontal and vertical changes. The excavation strategy has resulted in a huge data set.

The impact of the careful recovery methods and their systematic application can be shown by comparing species variations within the current excavation with that found in earlier excavation close to it (Bartosiewicz *et al.* 2024). This showed striking differences in the composition of the zooarchaeological assemblage from the trench in which bones were simply collected by hand and the one where systematic sieving was employed.

The site is being analysed and published in terms of phases that correspond to major changes in certain elements of the settlement (as reflected within the trench), with the material referenced here relating to the top Phase I (Vicze and Sørensen 2023).

THERE IS SO MUCH: THE SZÁZHALOMBATTA TELL IN NUMBERS

The excavation method outlined above has resulted in a very large and systematically recovered and recorded volume of diverse data. This is ideal for drawing a wide range of comparisons, spatial, temporal and across categories, and to propose interpretations about a range of activities and even about attitudes, such as whether they practice ideas about dirt and cleanliness.

The site can be summarized through numbers and different types of data. Phase I, which refers to the top layers of the tell covering a stratigraphy of approximately 0.8–1.0 m and something like 75–100 years of the Late Koszider-Vatya period (Middle Bronze Age), can, for example, be presented through its composition, a selection of this data is seen in Table 1. In addition, from this phase, there were also 780 Special Finds.

Table 1. Overview of the numeric data for bulk pottery and fauna from Phase I (Vicze and Sørensen 2023, 49).

SAX Phase I	Soil volume (l)	Ceramic, bulk (total no.)	Ceramic, total weight (g)	Average sherd weight (g)	Sherds per litre of soil (no.)	Bone, bulk (total no.)	Bone, total weight (g)	Average bone weight (g)	Bones per litre of soil (g)
Level 6	46549	10285	90334	8.8	0.221	8704	50801	5.84	0.187
Level 5	75289	14761	128846	9.0	0.196	8929	55425	6.21	0.119
Level 4	90675	18843	164408	8.8	0.208	10815	73033	6.75	0.119
Level 3	23335	12221	82136	7.2	0.524	4696	27319	5.82	0.201
Level 2	46588	22680	166854	7.6	0.487	9413	62205	6.61	0.202
Level 1	188994	70812	525406	7.1	0.375	17095	100894	5.90	0.090
Total	**471430**	**149602**	**1157984**			**59652**	**369677**		

Overall, by the end of the excavations season in 2023 we had excavated close to 1.2 million litres of soil (which were all either dry sieved or floated), had a total of 398,672 bulk ceramic finds and 2,294,460 fauna remains, taken 12,506 samples (for flotation, micromorphs, charcoal, *etc.*). A total of 14,458 special finds have been identified and recorded by Intrasis in the field, including 2449 special ceramic sherds or ceramic objects, 1597 pieces of lithics, 1130 bone tools, 846 bronze fragments, and 26 amber pieces (Fig. 1A–C). Phase II and III, still being analysed, will continue to add to the data.

How do we navigate this richness of data? The patterns, while very interesting and important, are, we want to stress, a reduction, and in that reduction, something is always lost. It is a reduction because it is an average of many different singular instances and one that is reached by placing objects within groups, such as worked bone tools. The decision behind these groupings, which are necessary to impose some order to otherwise information pandemonium, shapes the subsequent interpretation. For example, if rather than using material as the first variable (which in this example, causes a separation between worked bone tools and worked flint tools), the division was made between tools used in food processing versus those used in the consumption of food, then very different patterns would emerge from the analysis. The possible variables and combinations are beyond our imagination, so in general, well established disciplinary practices dictate how variables are selected and ranked. Through the many statistical measures of the finds that make up the site, we can quantitatively regenerate an outline of the matrix resulting from the many practices performed within the prehistoric community; but this leaves out objects for which different forms of inquiries are needed to make them speak.

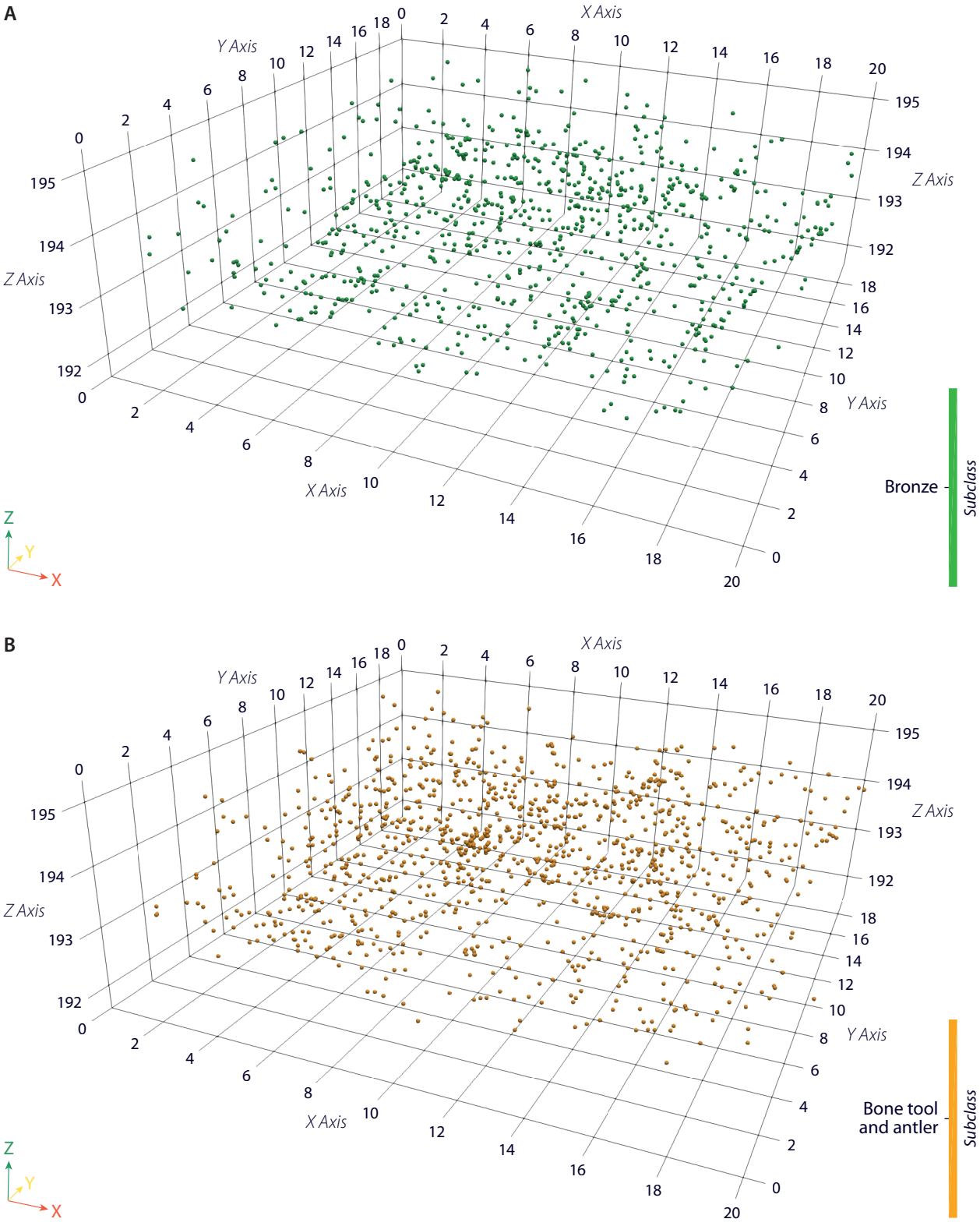

Fig. 1A–B. ***A*** *Representation of special finds (bronze) as recorded within the 20 m by 20 m trench in the digital Intrasis recording system;* ***B*** *Representation of special finds (bone tool and antler) as recorded within the 20 m by 20 m trench in the digital Intrasis re¬cording system (Graphic: Árpád Balogh).*

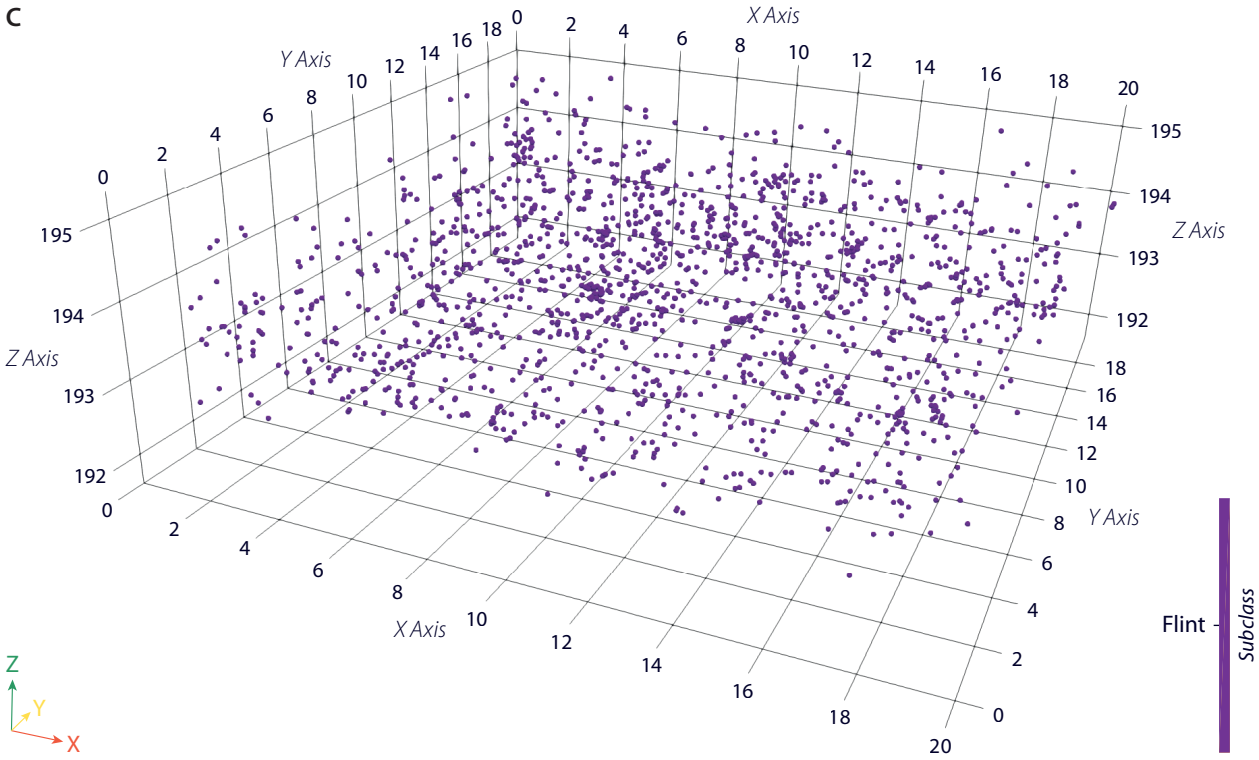

Fig. 1C. Representation of special finds (flint) as recorded within the 20 m by 20 m trench in the digital Intrasis recording system (Graphic: Árpád Balogh).

THE SINGULAR, THE UNIQUE, AND THE ONE-OFF

So let us think through some of the evidence we have which does not emerge within the big data, and whether it matters to our insights into the site. We have selected three groups, each is numerically minor but each nonetheless, we argue, brings a particular kind of insightfulness to our understanding of the community.

Inside into contacts through imported ceramics

110 imported ceramic sherds have been recorded from Phase I (not including level 1 as the finds in the top level are mixed with materials from later periods). Comparatively, this is only some 0.14 % of the total number of sherds from these levels — so in terms of the huge amount of material it is hardly anything and they are certainly not numerically significant. But the importance of these sherds is not based on quantitative measures but on qualitative ones, as it is due to their evidential value that they are important. All objects provide evidence, but some are more explicit and wider-ranging in what they reveal than others. The imported sherds, apart from providing evidence of fabric, type, abrasion *etc.*, in other words, evidence of their making and use, are in *themselves evidence* of contact with other communities; they provide explicit evidence of something beyond their own materiality. This makes even one imported sherd of interest. They provide information about areas of contact and also something about the character of that contact. So, for example, most of the imported sherds (96 sherds) are from encrusted pottery probably from Transdanubian, with just a very few imports from other cultural complexes: four sherds from the *Litzenkeramik* (Guntramsdorf-Drassburg) Group, seven sherds from the Gyulavarsánd Culture, two from the Füzesabony Culture and one from the Szeremle Group. Whereas this does not provide evidence of the regularity or scale of contact it does reveal that there was contact with other groups and that the area of the encrusted pottery may have been more familiar to them than other areas. The explicit awareness of that area is strongly suggested by some of the encrusted pottery sherds being local copies rather than actual imports (Sofaer and Roberts 2016). The copying of the pottery from another area is suggestive of some kind of desirability, the reasons for this may be diverse including simply copying pretty cups arriving at the settlement or it may be about potters using a style they had been familiar with when growing up but doing so in a new cultural set-

ting using different raw materials (*i.e.* fabric). These kinds of possibilities add to the evidential value of the encrusted ware sherds as they are not just testament to contact but introduce questions about desirability and cross-cultural referencing. The fewer sherds from other areas help to uphold this impression of a distinct relationship with the Encrusted Ware Culture.

Moreover, on the theme of desirability, except for a few sherds from large storage vessels and bowls from Level 2 (the top level of the Middle Bronze Age), the imported sherds are all from cups and small bowls, so vessels used in the serving of food and thus, we proposed, valued for their prettiness and foreign allure. At the same time, in terms of distribution within the trench, there are no distinctive characteristics, and as broken vessels these pots were not treated differently from sherds from other types of vessels.

Insight into an elaborate cuisine!

Twelve fireplaces, hearths, and ovens were found in Phase I (Vicze and Sørensen 2023). The number is noteworthy but does not in itself provide any measure of significance. What does become interesting, however, is not the number of hearths but the differences between them. It is as qualitative data, *i.e.* it is through description and attention to differences that they add to the story of the site.

Most of the hearths and ovens were from inside the houses, although some were found outside as open-air structures. Considerable attention was given to their construction, and for Phase I we have identified four types (for a detailed discussion of these types see Vicze and Sørensen 2023, 188–189). These types have also been observed on other Bronze Age tells in the Carpathian Basin. We have argued that the importance of the variation is that the different hearths/ovens would have enabled different methods of cooking. We argue:

"*The fireplaces could be used for roasting using spits. It could also be used for cooking pots if suspended over the fireplace or placed in the embers, although the latter is not a very effective method. The rimed hearth is different from fireplaces in that it contains the embers better and this would keep the heat longer. It would have been used in manners similar to the fireplaces, but also for the cooking of, for example, wrapped meat. The smaller size of the grated hearth suggests that it was indeed aimed at pot cooking. It is a rather sophisticated structure as the cooking takes place using indirect heat, and if kept stoked, it would have been very suitable for slow cooking, such as stews or porridges and other dishes which require controlled heat and long-term cocking. Finally, the ovens would be suitable for different kinds of baking, whether flatbread or leavened bread (as found in Phase II) as well as large pieces of wrapped meat. It is less suited to pot cooking, and especially not useful for the preparation of meals where stirring is involved.*"

(Vicze and Sørensen 2023, 188–189)

Why would there be such a range of cooking methods? We propose that this reveals a concern with effectiveness (both regarding firewood consumption and food preparation) and in turn reveals structures that are fit for specific purposes. The difference seems to be about facilitating different cooking methods and thus presumably the cooking of different dishes. The differences among the fireplaces, hearths, and ovens suggest a degree of affluence in terms of being able to produce varied meals from set food stables. In so doing it also reveals know-how and expertise, and some concern with bodily comfort.

On the unknowable. Is this a joke or a realistic depiction?

Another interesting challenge is the examples of human depictions. There are very few depictions of the human body within the large volume of objects from the site. From Phase I, we have identified only three examples. Out of the total volume of finds this is such a small number that we cannot use them for any kind of pattern recognition. However, this lack of presence is in itself a valuable insight and there are further observations that are worth drawing out – but are we catching at straws when attempting to use this material to learn more about life on the tell? The almost lack of depictions of the human form (or of animals) in any material and shape from the site ought to be recognized as important as it reveals something about the communities. In this case, the negative evidence is informative. We know that small figurines (of humans, animals, houses, and furniture) are relatively common finds in the Neolithic and Chalcolithic tells in the Carpathian Basin (Bánffy 2017) and further east, such as at the site of Pietrele in Romania (Hansen 2011). These, moreover, are usually small 3-D renderings of the subject, generally roughly done and with a sense of immediacy in how they were produced and maybe also attached to how they were used and handled. They are intimate.

No figurines have been found in the Vatya levels at Százhalombatta. In their place, anthropomorphic representations become two-dimensional raised decorations on large vessels, although still exceedingly rare. This is in line with what is known from other contemporary sites.

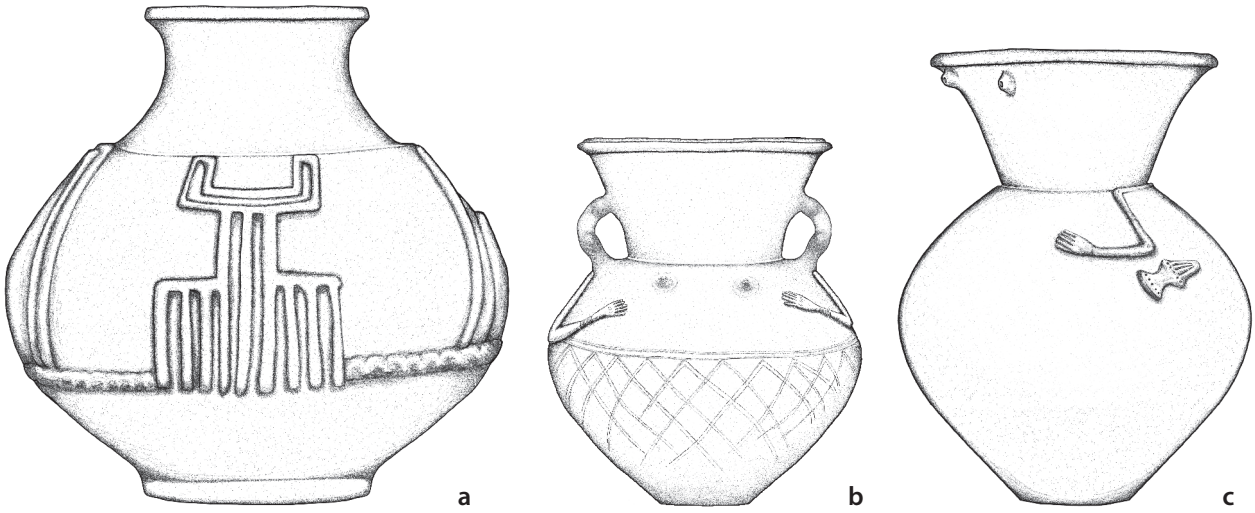

Fig. 2. ***a*** *Appliqué rib representation of a figure in an adoring position on a Nagyrév vessel;* ***b*** *Vatya vessel with anatomical elements in the right position on the vessels;* ***c*** *Vatya vessel with anatomical elements and a tool/weapon representation on the vessel (Drawings: Szilvia Jeney).*

In the Nagyrév cultural complex, prior to the Vatya cultural complex, depictions of humans consisted of double or in some instances triple parallel lines usually incised onto the body of small vessels showing stylised half or full human figures with raised arms (commonly interpreted as an adoration pose, Schreiber 1984; Vicze 2009). In most cases, these early depictions are, however, components of a more complex motif/design. It is interesting to note that although the representations use the same set of motifs, no compositions are the same. One cannot free oneself from the notion that here a story is told. This is a substantial change from the earlier small figurines, and this probably was not just about visual effects but also about conceptual shifts. One might ask what alterations resulted in such changes in societies' ontological representations, including the depictions of self and other beings.

As the Nagyrév cultural complex is the predecessor of the Middle Bronze Age Vatya Culture, which Phase I–III of Százhalombatta dates to (Nagyrév is dated to between 2500 and 2000/1900; Vatya is dated to between 2000/1900 and 1450 BCE), changes in the styles and themes of human depictions during this phase are of interest here. It is, therefore, noteworthy that during the final stage of the Nagyrév Culture simple rib decorations started to appear on the fine ware pottery, and we find the first example of decoration placed on the middle part of a large vessel (Fig. 2a). This can be characterised as an iconographical shift and a change of emphasis from a complex, geometrical, rather abstract depictions of humans and stories/narratives, to a depiction of a single human form as a central and enlarged figure (Csányi 1982–1983; Csányi 1992). In the Vatya anthropomorphic representations, the vessel in various ways becomes the object of anthropomorphism rather than a surface for depictions. This effect is reached by placing anatomical elements, such as arms, breasts, or even weapons/tools in the right position if the vessel is perceived as a body (Fig. 2a and c). This way of depicting human bodily elements on vessels so far seems to be unique to the Vatya cultural complex within the Middle Bronze Age of the Carpathian Basin (Makkay 1971; Kovács 1973; Kreiter 2005).

The placing of an arm, a weapon, or a pair of breasts on the body of a vessel provides a sense of the vessel being anthropomorphized, it is made meaningful in a particular way — but if that was an important expression, why are there so few examples? Or, if we approach this from another angle: how many examples are needed to make this an observation that can support interpretations or at least some kind of inference? Like a proposal such as: within the Vatya community, large vessels were metaphorically seen as bodies and could even be assigned gender. Or should this be reduced to: within the Vatya community, there *are examples* of large vessels being decorated with depictions of body parts. So far, scarcity as well as the use of particular decorative styles and elements emerge as qualities we need to recognize as rare but distinct features of the community, albeit rather open-ended in terms of what this reveals to us.

Meanwhile, one of the sherds with a raised rendering of a part of a human body provides us with an even greater challenge. The sherd has a raised or plastic decoration representing a human hand. It has stubby fingers, dimples at the place of the knuckles, and two

parallel grooves along the lower arm. It comes from the shoulder of a large (*c.* 80 cm high) Vatya culture storage vessel, a form typically found on settlements and as urns in burials, and no extra effort seemed to have been invested into their manufacture. But in this case, it shows a hand with six fingers (Fig. 3). Why this misrepresentation of the hand? The quality of Vatya pottery production generally is very high with some vessels being the work of experienced professional crafts people (Sofaer and Budden 2015). Evidenced by such examples, they could have made a very good rendering of a hand, and they certainly could make hands with five fingers if they wished so (see for *e.g.* Kovács 1973, figs. 3–4). So why did they not? This is where we encounter data that we cannot tame, we cannot make it speak coherently. The six-fingered hand could show the hand of a real person who had this trait, or it could have been the signature of a special or magic person or a sign, or could it simply be a joke? We can muse about the depictions or even postulate an interpretation, but without any parallels, *i.e.* not enough comparative data, we cannot analytically decide between alternatives. Clearly, such unique objects are not unimportant despite our inability to decide on what they reveal, but they are very difficult to explore. Such data is truly intriguing, it offers a glimpse of something but we are not sure what that something is.

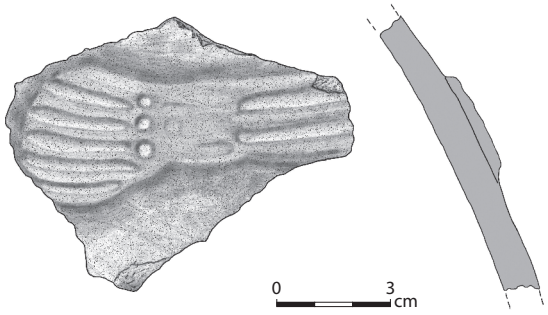

Fig. 3. A Vatya sherd with a human hand and arm representation from Level 4 (after Vicze-Sørensen, 2023, 119 fig. 4.56).

REFLECTIONS ON THE INTERPLAY BETWEEN DIFFERENT FORMS OF DATA – DIFFERENT KINDS OF RICHNESS

In contrast, qualitative data, as indicated in our examples above, is interpretation-based, descriptive, and based on a linguistic engagement with data as it cannot relay its insights through numbers. It encourages speculations about 'why, how, or what happened'. Handled with care, qualitative data widens the scope of our insight into Bronze Age life as it forces us to consider how their behaviour, including their thinking and attitudes, may be relevant to what we encounter. This data is also an excellent reminder of the parts of Bronze Age life that may completely elude us.

We are, therefore, challenged by such qualitative data– what do they enable? Are they flotsam, reflections on bits and pieces that did not carry too much weight in the main stream of settlement life, or, on the contrary, do they provide chance mementos of extremes that are not in themselves tangible but nonetheless important aspects of communities? For example, do they help to provide access to spiritual rituals, medical activities or even the presence of secret societies (Hayden 2018). Such suggestions cannot easily be verified but we can look at them as both cautioning reminders of the limitation of our sources and also as a stimulation to speculate and ask questions even when we acknowledge they cannot be answered.

A further challenge is, therefore, about validation. Quantitative and qualitative data analyses each have their ways of seeking validation, they rest on disciplinary experiences and traditions, but they tend to be very different, so how do we combine or, ideally, interweave the insights that emerge from the two data sets? Within discussions of methodology much attention is given to this challenge, and it is widely agreed that combining both kinds of data will provide richer insights as they balance each other out so that the limitations of each will be improved. There is, therefore, widespread acknowledgement that integrating different ways of knowing enrich our understanding, and also various advice about how to combine or integrate such different data. Such discussions are, however, often based on the assumption that it is the same core question/phenomenon that is being addressed through the two data sets, for example analysis of a museum visits where questionnaires may be combined with participant observation. The bits and pieces that we have introduced above are, we think, pointing to a more fundamental challenge as they relate to varied dimensions of society and to activities that leave different amounts or kinds of traces. So, prior to any methodological decision about compartmentalising or integrating data, we may need to engage more exhaustively with the question of how and why these data are different. This, we propose, will return us to reflexion about why and how some practices become part of routine, sharing forms and densities, and others do not, and how within this difference we find some of the distinctiveness of 'culture' as well as human group behaviour.

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REFERENCES

Bánffy, E., 2017. Eastern and Central Europe. *In*: T. Insoll, ed. *The Oxford Handbook of prehistoric figurines*. Oxford: OUP, 709–728.

Bartosiewicz, L., Vicze. M., Sørensen, M.L. S., Cummings, P., 2024. A high-resolution study of Bronze Age fish remains from Százhalombatta–Földvár, Hungary, *Folia Archaeologica* 58, 19–30.

Csányi, M., 1982–1983. A nagyrévi kultúra leletei a Közép-Tiszavidékről. *Szolnok Megyei Múzeumok Évkönyve*, 33–65.

Csányi, M., 1992. Bestattungen, Kult und sakrale Symbole der Nagyrév-Kultur. *In*: W. Maier-Arendt, ed. *Bronzezeit in Ungarn. Forschungen in Tell-Siedlungen an Donau und Theiss.* Frankfurt am Main, 83–87.

Evans, C., Aldred O. and Cooper, A., 2023. Dense pasts: settlement archaeology after Fox's The archaeology of the Cambridge region. *Antiquity* 97(395), 1193–1211.

Hansen, S., 2011. Figurines in Pietrele: Copper Age ideology. *Documenta Praehistorica* 38. 117–129.

Hayden, B., 2018. *The Power of Ritual in Prehistory: Secret Societies and Origins of Social Complexity*. Cambridge: Cambridge University Press.

Kovács, T., 1973. Representations of Weapons on Bronze Age Pottery. *Folia Archaeologica* 24, 7–31.

Kreiter, A., 2005. Middle Bronze Age ceramic finds from Százhalombatta-Földvár, Hungary. *In: Poroszlai and Vicze 2005*, 9–26.

Makkay, J., 1971. A Dagger of Mycenaean Type Represented on a Bronze Age Urn from Dunaújváros. *Acta Archaeologica Academiae Scientiarum Hungaricae* 23, 19–28.

Poroszlai, I. and Vicze, M., 2000. *Százhalombatta Archaeological Expedition (SAX) Annual Report I*. Százhalombatta: Matrica Múzeum 2000.

Poroszlai, I. and Vicze, M., 2005. *Százhalombatta Archaeological Expedition (SAX) Report 2*. Százhalombatta: Matrica Múzeum 2000.

Sofaer, J. and Budden, S., 2015. Many hands make light work: potting and embodied knowledge at the Bronze Age tell at Százhalombatta. *In*: M.L.S. Sørensen and K. Rebay-Salisbury, eds. *Embodied Knowledge. Perspectives of belief and technology*. Oxford: Oxbow. 117–127.

Sofaer, J. and Roberts, S., 2016. Technical Innovation and Practice in Eneolithic and Bronze Age Encrusted Ceramics in the Carpathian Basin, Middle and Lower Danube. *Archäologisches Korrespondenzblatt* 46, 479–496.

Sofaer, J., Sørensen, M.L.S. and Vicze, M., 2020. The Practice of Everyday Life on a European Bronze Age Tell: Reflections from Százhalombatta-Földvár (Hungary). *In*: A.B. Gonzales and T. Kienlin, eds. *Current Approaches to Tells in the Prehistoric Old World*. Oxford: Oxbow, 163–172.

Schreiber, R., 1984. Szimbolikus ábrázolások korabronzkori edényeken. *Archeológiai Értesítő* 111, 3–28.

Sørensen, M.L.S., Vicze, M. and Sofaer, J., 2020. Paradigm Shift? Bronze Age tell archaeology after 1989. Reflections from the Százhalombatta-Földvár Excavation Project. *In*: K. Šabatová, L. Dietrich, O. Dietrich, A. Harding and V. Kiss, eds. *Bringing Down the Iron Curtain. Paradigmatic change in research on the Bronze Age in Central and Easter Europe?* Oxford: Archaeopress, 147–156.

Vicze, M., 2005. Excavation methods and some preliminary results of the SAX Project. *In: Poroszlai and Vicze 2005*, 65–80.

Vicze, M., 2009. Nagyrév symbolism revisited: Three decorated vessels from Százhalombatta and Dunaújváros. *Tissicum* 19, 309–319.

Vicze, M. and Sørensen, M.L.S., 2023. *Living in a Tell: Memory and Abandonment. Százhalombatta-Földvár Phase I (Late Koszider)*, Archaeologia Hungarica 55. Budapest: National Museum of Hungary.

Vicze, M., Sørensen, M.L.S. and Sofaer, J., 2017. Advances in tell research – methodological reflections on the SAX Project. *In*: G. Kulcsár, G.V. Szabó, V. Kiss and G. Váczi, eds. *State of the Hungarian Bronze Age Research. Proceedings of the conference held between 17th and 18th of December 2014,* Ősrégészeti Tanulmányok 2. Budapest: Institute of Archaeological Sciences, 487–495.

CHAPTER 3

Perspectives on Power

Figure chapter 3: Trypillia mega-site Maidanetske, Ukraine. Reconstruction of activities within a communal building (mega-structure 3), which was used, among other things, for assemblies, the communal consumption of produced surpluses, textile and grain processing (Drawing: Susanne Beyer; graphic: Petra Horstmann).

Faszination Gewalt/Fascinating Violence?
Narratives of Violence in Prehistoric Societies from a Gendered Perspective

Johanna Brinkmann

KEYWORDS: *prehistoric archaeology, violence, gender, narratives, captives, trauma*

Abstract

Warfare, violent conflicts and interpersonal violence have been an endless source of fascination for scholars in prehistoric archaeology. There still seems to be a persistent urge to prove that violence existed in prehistoric societies. The best direct evidence for violence in prehistoric societies comes from skeletal trauma on human remains. In discussing a case of gendered violence from the Linearbandkeramik (LBK) mass burial sites, it is shown that archaeological narratives explaining violent events often implicitly contain sexualised violence against women. However, this is rarely discussed explicitly. It is argued that this implicit practice together with the use of soft metaphors obscures and downplays sexualised violence, which should be acknowledged like any other form of physical or structural violence. Therefore, sexualised violence can be identified as a neglected theme in the discussion of prehistoric violence.

Zusammenfassung

Kriege, gewaltsame Konflikte und zwischenmenschliche Gewalt haben die prähistorische Archäologie stets fasziniert. Es besteht dabei eine anhaltende Tendenz, Nachweise für die Existenz von Gewalt in prähistorischen Gesellschaften zu finden, wobei Verletzungen an menschlichen Skeletten einen direkten Nachweis darstellen. Anhand der sogenannten Massengräber der Linearbandkeramik — eines der wenigen sicheren Beispiele für geschlechtsspezifische Gewalt in der Prähistorie — wird aufgezeigt, dass archäologische Narrative in Bezug auf gewalttätige Ereignisse häufig implizit sexualisierte Gewalt gegen Frauen beinhalten, wobei eine explizite Diskussion dieses Themas jedoch ausbleibt. Es wird argumentiert, dass diese Praxis in Verbindung mit der Verwendung weicher Metaphern sexualisierte Gewalt verschleiert und verharmlost, die wie jede andere Form physischer oder struktureller Gewalt anerkannt werden sollte. Demzufolge kann sexualisierte Gewalt als ein vernachlässigtes Thema in der Diskussion über Gewalt in prähistorischen Gesellschaften identifiziert werden.

INTRODUCTION

Warfare, violent conflicts and interpersonal violence have been an endless source of fascination for scholars in prehistoric archaeology (Parker Pearson and Thorpe 2005; Otto *et al.* 2006; Dolfini *et al.* 2018). However, there seem to be different approaches to the topic in the Neolithic versus the Bronze Age and later periods. While in the Neolithic questions about interpersonal violence, scales of conflict and occurrence of endemic violence prevail (Meyer *et al.* 2018; Fibiger *et al.* 2023), in the Bronze Age a lot of research focusses on functions of weapons, who carried weapons, warrior identities and the rise of "war" in general (Kristiansen 1999; Bunnefeld 2018; Horn and Kristiansen 2018). *Männerbünde* and the warrior as a male identity are also popular topics (see Vandkilde 2006; 2018). Women and others are portrayed as collateral damage or the spoils of war, if at all (Vandkilde 2003, 135–137; Meyer *et al.* 2018, 32; Fibiger *et al.* 2023, 8).

In this article I will discuss certain aspects of the narratives surrounding the portrayal of violence in prehistoric societies, identify how these are problematic and show how we can move towards a more nuanced discourse. To illustrate this, a case of possible gendered violence from the end of the Linearbandkeramik is discussed. Gender is understood as the cultural construction of biological sexual difference (Cameron 2016, 62).

CONCEPTUALIZING VIOLENCE IN PREHISTORY

For decades, violence was not recognized as a research topic in European prehistory. Although, implicitly contained in some of the early culture historical narratives with its movements of cultural units, it only started to become a major subject of interest after the publication of Lawrence Keeley's (1996) influential book "*War before Civilization*". In his work Keeley argued, that archaeologists and anthropologists had consciously or unconsciously pacified pre-state societies in their writings, imposing a past-as-wished-for onto their subject, while airbrushing out unpleasantries like violence and warfare. Accordingly, this was partly also motivated by the desire to avoid naturalizing, and thus legitimizing, violence (Keeley 1996, 3–24; Armit 2011, 502–503). The avoidance respectively the interest in violence as a research subject are mirrored in the number of hits for the keywords "prehistoric violence" on Google Scholar, which have increased fifteen-fold from between 1900–1950 to the last thirty years (Tornberg 2022, 100 table 1). Some have argued, that the increased interest in this topic was also connected with the fact, that due to the Yugoslav Wars in the 1990s, European's were confronted with the first war on their door steps in over four decades (Guilaine and Zammit 2005). Indeed, in the last two decades a large number of anthologies, books and articles on the topic have been published *(ibid.*; Parker Pearson and Thorpe 2005; Armit *et al.* 2006; Otto *et al.* 2006; Baray *et al.* 2011; Dolfini *et al.* 2018; Knüsel and Smith 2019; Fontijn 2021; Fibiger *et al.* 2023), covering various aspects of violence, warfare and conflicts in prehistoric societies. One almost gets the impression that after decades of absence, the pendulum has now swung in the opposite direction with colleagues outbidding each other by bringing forward new evidence for violence, whether newly discovered or previously overlooked. Often, narratives suitable for newspaper headlines dominate the discourse, sometimes despite the lack of archaeological evidence (Peter-Röcher 2018; 2023, 120; Furholt 2020a). In general, there still seems to be a persistent urge to prove that violence existed in prehistoric societies.

This fixation on proving that violence was a part of human societies already in the past leads to an unsatisfyingly one-dimensional view of violence in prehistoric societies and to a division in two camps, which are diametrically opposed to each other. On the one side, the proponents of Thomas Hobbes' (1588–1679) political philosophy of a natural condition of humanity as a *war of all against all* (Hobbes 1651, 60–80) and on the other side, the advocates of Jean-Jacques Rousseau's (1712–1778) *noble savage* (Rousseau 1761). Both, Hobbes and Rousseau were scholars, whose *Menschenbild* was based on philosophical and political thought rather than on empirical data. They simply imagined a primordial human condition — referring to a time prior to state organization, i.e., a society without central authority. This "natural" social (not biologically determined) condition of humankind was in Hobbes' case a state of *war* and in Rousseau's case a state of *peace* (see Keeley 1996, 5–8; Fontijn 2021, 6, 10). The reception of these unilateral points of view ultimately led to under complex explanations and clichéd images of past societies, or as David Fontijn eloquently put it:

"*Seeing prehistoric society as either a group of violent barbarians or as peaceful hippies is both nonsensical and goes unsupported by the complex and nuanced evidence that archaeology has at its disposal. Humans are neither inherently altruistic or violent towards each other, but they are first and foremost social beings. And sociality may lead to peace and war.*"

(Fontijn 2021, 44; referring to De Dreu *et al.* 2016)

The prevalence of two totally opposing views on this topic also indicates that what we are discussing is not so much about evidence but more about deeper convictions (Fontijn 2021, 8). To escape this dualism and approach the subject in a conceptual way, Nakoinz *et al.* (2019) developed a model of conflicts, which considers both escalation and de-escalation strategies on different levels. In this scheme violence is level four of five in conflict escalation (Fig. 1). This approach incorporates both, conflicts and conciliation, as part of a spectrum of human (social) behaviour and includes coping mechanisms for resolving conflicts peacefully. In this model violence is seen as a last resort that generally involves a high level of escalation, and that is applied only when other means of resolving the conflict have failed, because it involves great losses on both sides. Conflicts are defined as disagreements, caused by different demands. In social interaction, persons try to enhance their own position and satisfy their own demands (or the demands of their group), in doing this, the taken action can reduce the capability of

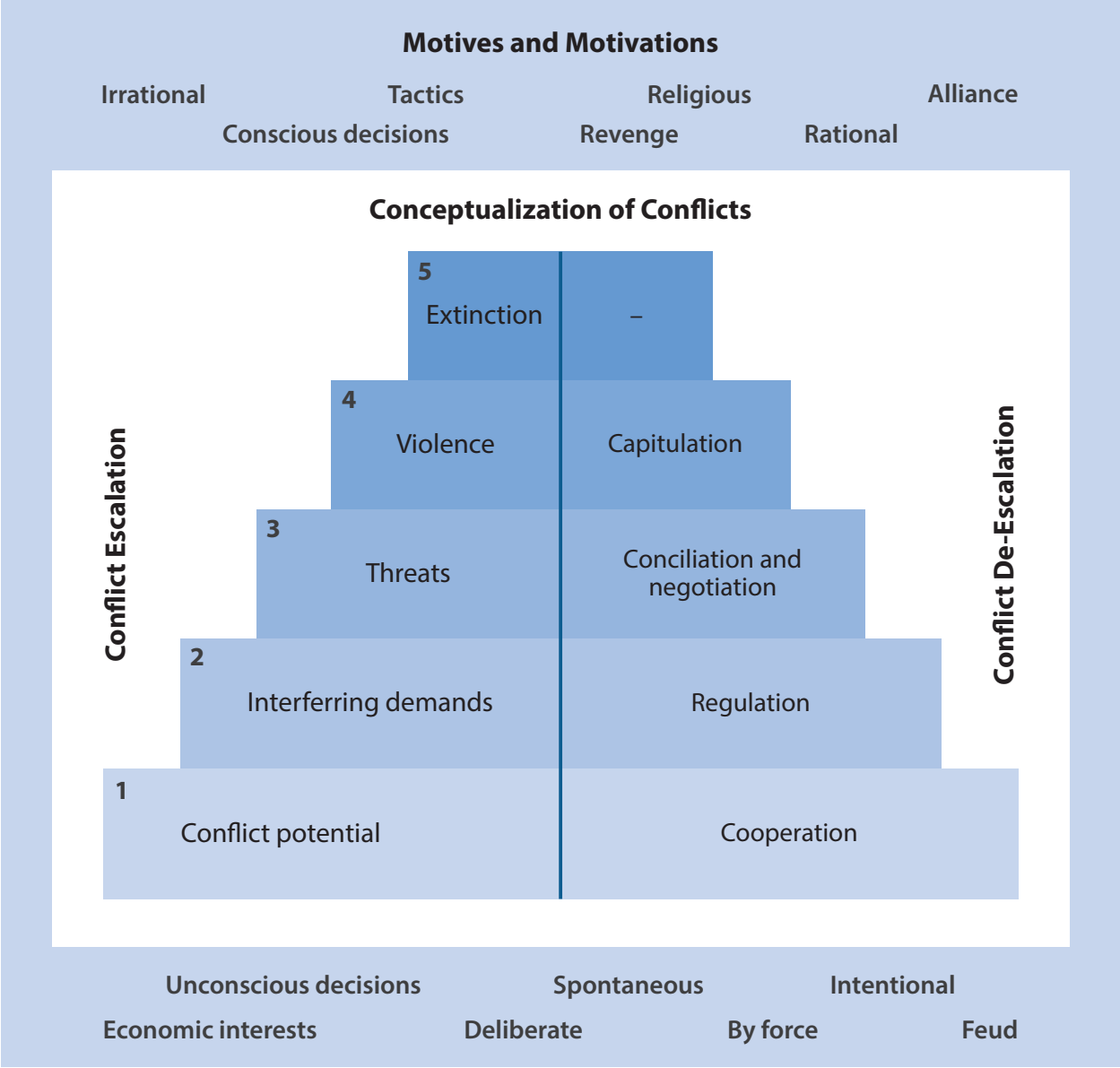

Fig. 1. Conceptualization of conflicts embedded in a pool of possible motives and motivations (after Nakoinz et al. *2019, 2 fig. 1).*

other people. Therefore, a conflict escalation is seen as a chain process, in which each party tries to reduce the other's and to increase the own capability (Arponen *et al.* 2016; Nakoinz *et al.* 2019, 1–4 fig. 1). Other scholars, too, have remarked that a reduction of conflicts to violence and warfare does not account for the complexity of human social interaction and that there is a spectrum of reactions ranging between empathy and violence. Also, the evidence for violence we see in the archaeological record needs to be seen in a broader social and chronological context (Armit 2011, 500; Fontijn 2021, 29). I would add here, that decisions are not always made conscious or intentional and that the conceptualization into escalation and de-escalation bares the risk of a false rationalisation of these processes. Also, de-escalation strategies like marriage alliances can involve forms of violence directed towards certain participants in these alliances (*e.g.* women) (see Bickle and Hofmann 2022).

EVIDENCE FOR VIOLENCE IN PREHISTORIC SOCIETIES

Frequently cited anthropological studies (*e.g.* Keeley 1996; see Fontijn 2021, 7) show that violence — to some degree — exists in all human societies and at all times. It manifests itself at different levels from individuals to communities. The earliest direct evidence for violent conflicts dates back to the Final Palaeolithic period (David-Elbiali 2011, 191). If we accept the premise, that violence is part of the diverse spectrum of human social interactions, the question is no longer, if violence existed in prehistoric societies, but rather in which situations and social settings and to which extent violence occurred and how we can detect it in the archaeological record?

Generalised statements about the levels of violence in pre-state or small-scale societies — like the ones we are expecting in European prehistory — are problematic and often contradictory. On the one hand, an influential study by Steven Pinker (2011) using archaeological data from around the globe presents the counter-intuitive conclusion, that the average death rate caused by warfare declined from 10–20 % in prehistoric and early historic societies to 1–2 % in the 20th century (Fontijn 2021, 6–7; see also Müller *et al.* 2024). Although, methodological issues have been raised concerning this study (Tung 2021, 132). On the other hand, a recent bioarchaeological survey including trauma data on 4500 adult crania from the pre-Hispanic and early Spanish colonial Andean shows, that the lowest levels of violence (cranial trauma) occur in early pre-state societies (Archaic, Formative and Early Intermediate period, 8000 BC–600 CE), ranging around 12 %, while an uptick in cranial trauma can be detected with the formation of two Andean states — Wari and Tiwanaku — in the Middle Horizon (600–1000 CE). With the changed socio-political organisation, the rate of cranial trauma rises to about 19 % in this period. Strikingly, the highest levels of cranial trauma are observed in the Late Intermediate period (1000–1400 CE) following the breakdown of these two expansive states. In this period the cranial trauma rate rises to 28 % (Tung 2021, 132–134). Here we see, that it is important to not only compare case studies from different parts of the world and different periods of (pre)history to prove generalised assumptions about human "nature", but to take into account the social and chronological context and to approach regional developments in a diachronic perspective. A study by Linda Fibiger *et al.* (2023, 4 table 1) compares cranial trauma data from different regions in Europe and gives a mean cranial trauma rate of about 11 % for the Neolithic. These studies can give an idea about the frequency of violence in prehistoric societies, but these numbers can also be misleading since most of the analysed crania are only dated by context and this can be especially problematic with bones from collective graves (Schulting and Wysocki 2005; Fibiger *et al.* 2013). Extensive dating programs have shown, that a significant number of the individuals from Neolithic megalithic tombs are actually from later periods (Blank 2017; Blank *et al.* 2020, 18 fig. 13–14).

Detecting concrete evidence for violence in the archaeological record can be quite ambiguous. The first and only direct evidence comes from skeletal trauma on human remains. While of course not all acts of physical violence leave traces on the bones and osteological inventories can be biased due to preservation and selective burial rituals, *ante-* and *perimortem* trauma on cranial and post-cranial parts of the skeleton are the most significant proxy for detecting physical violence in prehistoric societies. A related, but in earlier prehistory rather rare, direct evidence for violence are battlefields, which consist of artefact scatterings and can, but do not have to include human skeletal remains. Indirect evidence for interpersonal violence can be seen in the occurrence of weaponry, representations of weapons and violence in iconography (*e.g.* rock art), fortifications and settlement patterns that indicate defensive strategies. In principle, neither of those criteria in itself prove the occurrence of violence and they can be problematic, as they leave a lot of space for interpretation (Armit 2011, 505–507; Nakoinz *et al.* 2019, 4; Ryan-Despraz 2022, 3–24). For example, the absence of formal weaponry in the European Neolithic, does not mean that there were no weapons. Arrowheads in human bone and blunt force trauma on crania show that hunting devices and tools like axes and clubs were multi-functional and could be utilized as lethal weapons (Armit 2011, 507; Dyer and Fibiger 2017; Meyer *et al.* 2018; Fibiger *et al.* 2023). Further indirect evidence for structural violence detectable through bioarchaeological research are malnutrition, infectious diseases and occupational injuries on specific parts of the population (*e.g.*, sex or age groups) (Tung 2021, 133). In later periods historical sources, such as the Nordic sagas and Greek literary sources are telling us about conflicts and the management of conflicts. Other archaeologically detectable indicators of (violent) conflicts and conciliation may be the unequal distribution of wealth, social status and resources, a high population density, war-booty offerings, rituals, indicators of power and reign as well as burnt layers in settlements in connection with weapons and border structures (Nakoinz *et al.* 2019, 4).

HOLES IN HEADS: *LINEARBANDKERAMIK* 'MASSACRES'

If we turn back to the most reliable evidence for interpersonal violence in prehistory, the skeletal trauma, there is one example that has been brought up time and time again, to prove that humans are inherently violent or have at least been in a 'Hobbesian' state of violence since the adoption of agriculture (Fontijn 2021, 42). This is the case for some 'irregular' burials of the Linearbandkeramik (LBK) that are often referred to as 'massacres' (Meyer *et al.* 2018, 22; Fibiger *et al.* 2023, 6–7). These are mass burials of multiple individuals, which are deposited in a disorganised and commingled manner without recognisable care expectable in regular burials (Meyer *et al.* 2018, 23). The LBK (*c.* 5500–4950 cal BC) is an archaeological phenomenon that is characterised by relative uniformity in cultural expression consisting of long houses, a gendered mortuary tradition and the eponymous pottery that were brought to Central Europe by these first farming communities (Fontijn 2021, 11–16; Müller-Scheeßel *et al.* 2021, 65). The sites discussed here are Talheim, Schöneck-Kilianstädten and Halberstadt in Germany and Asparn/Schletz in Austria.[1] In these sites the majority of individuals displayed perimortem injuries, mostly traumatic lesions on the parietal bones of the skull (on the back side of the head), which match the typical stone adzes of the LBK, so called *Schuhleistenkeile*. In addition, in Schöneck-Kilianstädten frequent trauma on the mandible and temporal bones of the skull were observed, which was interpreted as signs of face-to-face combat. Furthermore, there are indications for possible *ante-mortem* torture or *post-mortem* mutilation in Schöneck-Kilianstädten evidenced by fractures of the lower leg bones tibia and fibula. The human remains were deposited in burial pits and in the case of Asparn/Schletz in ring ditches (Meyer *et al.* 2018, 25–27).

In general, the degree of violence displayed in the discussed sites cannot be taken as characteristic and representative for the LBK as a whole. A comparative survey of skeletal remains from different literature sources shows a cranial trauma rate of only 2–6% for LBK adult populations (Müller-Scheeßel *et al.* 2021, 77 fig. 9). Furthermore, judging from the material culture, LBK communities did not have anything close to specialised weaponry and we do not see specialised warriors or an ideological celebration of violence in the archaeological record (Fontijn 2021, 29–30). Most compellingly, all events of short-term violence in the discussed sites fall in the latest phase of the LBK before or around 5000 cal BC (Teschler-Nicola 2012, 101; Müller-Scheeßel *et al.* 2021, 78). And indeed, it has been postulated that the multiple burials observed here are resulting from social developments limited to a 'crisis' phase at the end of the LBK. This interpretation is mainly based on the occurrence of mass fatality sites and enclosures during the latest phase of the LBK, though, this impression is probably reinforced by the diversification of the burial rites in this period, which often include a manipulation of the human remains, that has been mistaken for *ante-* or *peri-mortem* violence. The explanations for the crisis hypothesis range from instability in the access to resources to a breakdown of the expansion model of the LBK (Fontijn 2021, 14, 17, 25; Müller-Scheeßel *et al.* 2021, 78–80). Even if the idea of a crisis at the end of the LBK is a little bit oversimplified, the violence observed here seem to represent short-term violent events, which should not be mistaken as evidence for the persistence of endemic violence throughout the LBK (Tornberg 2022, 99).

An analysis of the demographic of the deceased communities shows interesting patterns and has been used as basis for the interpretation of these sites (Table 1). Generally, they support the conclusion, that these mass burials are the result of a short-term violent event that — in the case of Talheim, Schöneck-Kilianstädten and Asparn/Schletz — wiped out a whole community. Subadult individuals of the groups Infans I and Infans II are present in all of the sites with the exception auf Halberstadt, they make up for 38% in Talheim, 46% in Schöneck-Kilianstädten and 35% in Asparn/Schletz. Individuals of the group Juvenis are present in all sites and range between 4–11%. Especially noteworthy is the sex ratio in the different adult age groups. Individuals of the group Senilis are nearly absent, while we see a balanced sex ratio in the Maturus group. If we look at the Adultus group (20–40 years), an underrepresentation of biologically female adult individuals becomes apparent.

1 The focus in this section is on mass burial sites that display evidence of trauma and no signs of formal burial practices. Therefore, Herxheim is excluded, which is not only highly controversial in the interpretation (see Peter-Röcher 2023), but also shows complex ritualized behaviour concerning the human remains from the site. Likewise, Vráble in Slovakia is not discussed here, because all human remains from the site — even the ones with signs of trauma or post-mortem beheading — show either formal burial practices (*e.g.* through the presence of grave goods) or evidence of ritualized manipulation of the human remains (Müller-Scheeßel *et al.* 2021, 69–71). Wiederstedt is not discussed either, because the individuals there do not display any signs of trauma and it is not clear, whether they died in a violent event or *e.g.* in an epidemic (Meyer *et al.* 2018, 26).

The sex imbalance is most obvious in Schöneck-Kilianstädten, where no biological females in this age group were identified. In Halberstadt we identify 88 % males and 13 % females, in Asparn/Schletz 77 % males and 23 % females, in Talheim the sex imbalance is less pronounced but still clearly visible with 64 % males and 36 % females in the age group 20–40 years (Meyer *et al.* 2018, 31–32).

*Table 1. Demography of ‚irregular' mass burial sites of the LBK (**M** biologically male, **F** biologically female; the total number of individuals in one site may deviate from the summed numbers of individuals in the age groups, since individuals lacking reliable age and sex determination were not included; data from Meyer* et al. *2018, 31 table 2.1).*

Site	Total number of Individuals	Infans I	Infans II	Juvenis	Adultus		Maturus		Senilis	
					M	F	M	F	M	F
Talheim	34.0	7.0	6.0	3.0	7.0	4.0	2.0	3.0	1.0	-
Schöneck-Kilianstädten	26.0	10.0	2.0	1.0	9.0	-	-	2.0	-	-
Asparn/Schletz	60.0	12.5	8.5	5.5	16.5	5.0	9.5	8.5	-	-
Halberstadt	9.0	-	-	1.0	7.0	1.0	-	-	-	-

The differential treatment of younger women or women in the reproductive age in collective violent events has been repeatedly interpreted as evidence for captive taking (see Fibiger *et al.* 2023, 8) and this is also the interpretation favoured in the case of the LBK mass burials discussed here. The authors explain the sex imbalance in the adult individuals from Talheim, Schöneck-Kilianstädten and Asparn/Schletz with an ambush, conducted by a neighbouring LBK community, that resulted in the killing of the younger, elderly, and male population segments of the attacked community and the abduction of (most) women between the age of 20–40 (Meyer *et al.* 2018, 32). This interpretation is supported by the demographic situation in Halberstadt, where seven adult male individuals, one adolescent male individual, and only one probable adult female individual, but no children or older persons were found, leading to the conclusion that this mass burial is not representative of a local residential community. Since the isotope analysis of these individuals show a different diet and geographical origin from the individuals buried within the settlement and the cranial trauma is located in a tightly circumscribed area of the partial bones, the grave was interpreted as containing the remains of a failed raiding party that was caught and executed by the local community (Meyer *et al.* 2018, 28–31). The practice of captive taking is well evidenced in anthropological studies (Cameron 2011; 2016) and will be discussed in detail below.

CAPTIVES: A GENDERED PERSPECTIVE ON VIOLENCE?

If we want to follow the interpretation that the mass burial in Halberstadt contained the remains of a failed raiding party or not, the sex imbalance in the burials of Talheim, Schöneck-Kilianstädten and Asparn/Schletz is striking and the abduction of these woman as captives could provide an explanation. The LBK 'massacres' are a case where this interpretation has been brought forward prominently and has been repeatedly cited in articles about other forms of interpersonal violence (*e.g.* Fibiger *et al.* 2023, 8). However, there has not been much reception about the act of captive taking and the implications for these female individuals in European prehistoric archaeology. It has been stated that the practice is well known from ethnographical sources with reference to Otterbein (2000), who focusses on the killing of captives and does not discuss the fate of the female captives any further, beyond stating that woman and children are often "*spared*", *i.e.* not killed in violent events, but become "*mates*", or slaves or are "*incorporated as wives*" in the attacker's society (*ibid.*, 439). And, indeed, in their article Meyer and colleagues rather vaguely state that the captive taking of women

"*was probably followed by forced inclusion into the attacker's own communities, although the further fate and status of these women remains unknown.*"
(Meyer *et al.* 2018, 32)

In the following I will discuss some implications of this interpretation and why it matters in the discourse on how we portray prehistoric societies.

First and foremost, we are talking here about absent women and this is quite fitting, literally, since Helle Vandkilde remarked 20 years ago that "*the female half of society still [is] without a place in history*" (Vandkilde 2003, 135), at least in European prehistory. Since

then, there has been some development and especially for the Bronze Age we now have numerous studies on the mobility and lifeways of (high status) woman (Frei *et al.* 2015; 2017; Reiter *et al.* 2019; Cavazzuti *et al.* 2021), while for the Neolithic studies concerning females seem to focus on overarching themes like the impact of agriculture on health (Macintosh *et al.* 2017; Penezić *et al.* 2020) and rarely concern female identities (Bickle 2020). This trend is mirrored in google statistics with 90.700 hits for "Bronze Age women" and only 26.000 hits for "Neolithic women" on Google Scholar in the period between 2003 and 2023 (as in 27.11.2023). One emerging topic is the discussion on Neolithic gender (Hansen *et al.* 2015; Robb and Harris 2018), and it has been argued that gender analysis in Neolithic studies has not been done until recently not because Neolithic gender is different from that of the Bronze Age, but because this topic is still mostly studied by female, non-binary and transgender scholars, who tend to be underrepresented in high-visibility publications and who are to a lesser degree represented in publications on the Neolithic than on the Bronze Age. Bluntly speaking, the lives and identities of females are less discussed for the Neolithic, because less female scholars work on and publish about the Neolithic than about the Bronze Age (Gaydarska *et al.* 2023, 278). It is therefore worthwhile to talk about women in the Neolithic and especially so, because one of the few instances, where we get to learn something about women in the Neolithic is when they are victims of violence like in the case of the LBK mass burials. The interpretation of which has been frequently cited, but can be problematic in the way in which the lives and roles of these women are portrayed. Before elaborating on this point, we have to take a look at the anthropological evidence on captive taking.

In her book *"Captives. How Stolen People Changed the World"* Catherine Cameron (2016) draws on ethnohistoric, ethnographic and historic accounts of captive taking in small-scale societies in different regions of the world encompassing parts of North America, South America, Africa, Medieval Scandinavia and Southeast Asia. Critically acknowledging the potential and constraints of her sources, Cameron shows the almost universal nature of the practice of captive taking (Cameron 2016, 19–20, 41) and notes that this is a gender selective practice (Cameron 2011, 169), where captors are typically (young) adult males and captives are mostly reproductive-age women and in some instances children (*ibid.*, 59–62). Entering the captors society, the captives undergo "social death", completely losing the social person they had been in the society of their origin (*ibid.*, 43). Also, the circumstances surrounding the capture can determine the captive's social location in the captor society. As many captives are taken during warfare or violent events, this may perpetuate negative feelings toward the captive's social group and constrain their social position and opportunities for social advancement in the captors society (*ibid.*, 69). Cameron stresses, that captives, from the moment of their capture became ultimately vulnerable and powerless and, most significantly, surrounded by people to whom they claimed no kinship. Their new social position was dictated by their captor's social position and could be located outside the kinship system in a slave status or marginally within the kinship system as affinal kin (wives) or in the case of some children they could occasionally be adopted as consanguineal kin (*ibid.*, 75). Regarding the status as affinal kin, Cameron notes, that captive women claimed as wives were in a significantly more vulnerable position, since they were without kin in the captor society. This was possibly an advantage to their husbands, since they were unlikely to have their loyalties divided between their husband and their natal family (*ibid.*, 70). This also meant that they had no relatives to defend them if their husband abused them, and their captive children could be subject to abuse by other children or adults as well (Cameron 2011, 183). Also, depending on their status they would potentially have to cope with malnutrition or physical abuse (*ibid.*, 199). On the other hand, in some instances, captive women may have played a role in linking groups across linguistic or social boundaries (Cameron 2016, 36).

SEXUALIZED VIOLENCE IN ARCHAEOLOGICAL NARRATIVES

In general, phrases like "*forced inclusion*" (Meyer *et al.* 2018, 32) into the captor's societies are soft metaphors (Vandkilde 2003, 128) that may obscure practices, that are more uncomfortable to discuss. However, we get a much clearer picture concerning this topic, if we again look at Cameron's work. She observes, that the value of women for the capturing communities can be grouped into three intertwined categories: their use as a sexual partner, their reproductive abilities, and their labour (Cameron 2011, 182–183):

> *„Young women became concubines in many societies, where their value as a sexual partner may have been foremost. Reproduction may have been most important when 'wealth in people' or population replacement was a primary objective of captive taking. Captive labour, especially for labour that was gendered female (regardless of the biological sex of the person undertaking the labour), seems to have been important in most societies."* (Cameron 2016, 63)

Note, that although the term reproductive-age may imply the importance of reproductive abilities, this is not necessary the most prized value in captor societies. Cameron also stresses, that horticulturalist societies reliant on crop production significantly relied on the labour of women (Cameron 2016, 64) and this has been confirmed for Central European agricultural societies by analysis of female skeletons (Macintosh *et al.* 2017). Furthermore, she makes it clear in her study, that

"*every society that took captives almost certainly used captive women as sexual partners, but this was probably not their primary value in most societies.*"
(Cameron 2016, 63)

So, if we assume that the missing female individuals from the LBK 'massacre' sites were taken captive and we talk about violence in these sites, we most certainly not only talk about lethal violence in the form of blunt force trauma, but also about sexualized violence against women.[2] This is somehow implied in the original interpretation which speaks of "*forced inclusion*" (Meyer *et al.* 2018, 32) and "*violent abduction of marriage partners*" (Fontijn 2021, 24), but has never been made explicit. This is especially interesting, since female exogamy has been postulated for the LBK on the basis of isotope data (*ibid.*, 14; Bickle and Hofmann 2022). In any case, we should not make the mistake to limit the discussion of sexualized violence to exceptional short-term violent events, since Bickle and Hofmann show, that women's role in patrilocal societies can greatly vary and are dependent on a multitude of factors such as economic prospects and the presence of support networks (*ibid.*, 110–113).

In general, this is not an isolated case. There are other narratives in European prehistoric archaeology, that imply sexualized violence, one prominent example for the Neolithic being the spread of the so-called "steppe ancestry" with the Yamnaya and Corded Ware. On the basis of aDNA analysis it has been postulated that the observed changes in genetic ancestry have been caused by massive migrations from the Eurasian steppe from 2900 BCE onwards (Haak *et al.* 2015; Kristiansen *et al.* 2017; although see Papac *et al.* 2021), whereby archaeological cultural groups are equated with (homogeneous) groups of people that spread in block-like entities across Europe (see Furholt 2018, 169). The terms used to describe this scenario include, again, a lot of soft metaphors and range between "*genomic transformation*" and "*complete turnover of ancestry*" in parts of Europe (Olalde *et al.* 2018, 193). Now, one could argue that these papers have been written by archaeo-geneticists and include a certain neutral language as part of the academic writing style. However, the scenario has also been described by archaeologists, painting a colourful picture of a social system, which

"*was likely to have included war-bands of young males living of raiding proving themselves before entering the tribe proper. Such groups of young males were highly mobile and willing to take risks by undertaking pioneering migrations.*" (Iversen 2019, 90)

This is a widely agreed on interpretation that has been adopted by the media and in exhibitions, *e.g.* in Moesgaard Museum (Aahus) there is a life-size visual reconstruction of three young adult males with battle axes posing like a street gang looking for trouble. I would argue, that this narrative just like the one surrounding the LBK mass burials implies sexualized violence. Martin Furholt, who has extensively commented on the political problematics of the Corded Ware migration scenario, briefly touches on the subject, when he asks, if we have to acknowledge a past

"*we may not like*" filled with "*violent misogynist hordes from the East, forming biologically defined groups of young males, who bully their way through Europe, killing and raping themselves into our gene pool.*"
(Furholt 2020a, 25)

This is not the place to comment on the validity of the Corded Ware expansion scenario, although it has been shown, that the discussed narratives have been under-complex and do not represent an accurate reflection of the archaeological record (Furholt 2018; 2020b; Papac *et al.* 2021). Instead, I will argue below why the implication of sexualized violence in archaeological narratives has to be discussed.

Generally, scientific narratives and interpretations are products of their *Zeitgeist* and are influenced by societal trends and political developments. And since sexualized violence is still a heavy stigmatised topic (Kennedy and Prock 2018), it is no surprise that the implications of these narratives have not been discussed openly amongst archaeologists. At the same time sexualized violence is often aestheticized, trivialized, normalized or romanticized in popular display (*e.g.* in

2 The term "sexualized violence" describes any violence, physical or psychological, carried out through sexual means or by targeting sexuality, including rape and sexual assault. People of all genders can be affected by sexualised violence; this article specifically focusses on sexualized violence against women.

Evidence for Violence in Prehistoric Societies			
	Physical	**Structural**	**Sexualized**
Direct	Skeletal trauma Battlefields (Written sources)	(Written sources)	(Written sources)
Indirect	Weaponry Iconography Fortifications	Malnutrition, infectious diseases, occupational injuries on specific parts of the population (*e.g.* age/sex groups)	Sex imbalance in skeletal inventories Iconography
Associated	Settlement patterns High population density Unequal distribution of wealth/resources/ social status (*e.g.* in burials)	Unequal distribution of wealth/resources/ social status (*e.g.* in the spatial design of houses/ settlements)	Mass fatality sites/ battlefields (sexualised violence as a tactic of war/ weapon)

Fig. 2. Evidence for violence in prehistoric societies, including physical, structural and sexualized violence. Archaeological evidence is categorized into direct, indirect and associated evidence, whereby associated evidence refers to features and patterns that could be related to violence but are more fuzzy than indirect evidence.

movies, music or literature) (Herrmann and Klocke 2020), which together with the social stigmatization leads to a stereotypical and incorrect portrayal of sexualized violence in the public image but also in scientific narratives. This phenomenon is subsumed under the term "rape culture", which describes a culture of "victim blaming", "slut shaming" and the trivialisation of sexualised violence (*ibid.*, 63). Including the dissemination and prevalence of "rape myths" (Krahé 2016), which represent

> *"descriptive or prescriptive beliefs about sexual aggression (*i.e.*, about its scope, causes, context, and consequences) that serve to deny, downplay or justify sexually aggressive behaviour that men commit against women."*
> (Gerger *et al.* 2007, 423)

These societal preconceptions about sexualized violence are mirrored in the archaeological narratives, most apparent by downplaying acts of sexualized violence through the use of soft metaphors. And, although, they are hard to grasp in this context, one could argue that phrases like "*forced inclusion*" (Meyer *et al.* 2018, 32) and "*violent abduction of marriage partners*" (Fontijn 2021, 24) evoke pictures of women who, despite of being abducted by force, were integrated into their captor's community as full members, where they enjoyed the same status as in their native community. Because becoming someone's "wife" does not sound that bad, right? This wording inadvertently obscures and downplays the violence these women — in case of the LBK 'massacres' — would have most possibly faced, if we want to follow this narrative.

In this sense, sexualized violence is invisible in the archaeological record in two ways. First, because it is almost impossible to identify in the archaeological record without written sources, and if it is identified, as possibly in the case of the LBK 'massacres', it can only be recognized indirectly. And second, because it is made invisible in our narratives by the use of soft metaphors. Why does this matter, if we can barely detect sexualized violence anyway? There may be the impulse to not address this sensitive topic at all, because one does not want to say anything wrong or does not want to be the creator of narratives that are ultimately sexist and misogynist or portray prehistoric societies as sexist and misogynist. However, I would argue, that in completely ignoring the topic, we as scientists are not doing ourselves any favours either. Because if we not address the topic explicitly, but only imply it in our narratives, the missing part will be auto-completed in the readers minds, be it scholars' or the public. And our heads, as numerous studies from psychology and social science show, are still full of stereotypes and misconceptions about sexualized violence against women (Gerger *et al.* 2007; Krahé 2016). In addressing this topic appropriately and respectfully in a non-voyeuristic and non-stereotypical way, we acknowledge suffering and

very real violence which at least half of humanity had to endure to different extents during various events or periods of (pre)history, just as we acknowledge physical violence from skeletal trauma or structural violence, *e.g.* from malnutrition of parts of a population (Fig. 2).

CONCLUSION

To come back to the case of the LBK mass burials again, I would argue that the sex imbalance in the adult individuals and the demographic structure of the burials make it likely, that these short-term violent events included the abduction of reproductive-age women. The nature of the skeletal trauma (including the cranial trauma, but also the broken lower legs), shows excessive violence, which would have been accompanied by a dehumanisation of the assaulted group and their individuals. This would have affected the captive's status in the captor's community, where they — very likely — would also have experienced sexualized violence. Adding this aspect to the narrative acknowledges sexualized violence as a form of violence expectable also in prehistoric societies. The case of the Corded Ware migration scenario is a bit different, because here the sexualized violence is only implied in the narrative and cannot be proven my means of archaeological evidence. Furthermore, there is a possible racist component here which Furholt has pointed out (namely, a 'clash of cultures' between genetically defined cultural entities, one of these entities coming from the East and 'overrunning' the other). The implied sexualized violence in this narrative is thereby highly problematic, because it is used to reinforce racist stereotypes (Furholt 2020a). Also, recent studies have shown, that a mass migration from the Eurasian steppe is a highly unlikely scenario and that we are dealing which a much more complex process (Furholt 2020b; Papac *et al.* 2021), hence, this narrative should be completely rephrased or abandoned. And while violent events are the most obvious starting point to address this topic (Western and Hurst 2019), the overall discourse on sexualized violence in prehistory should not be limited to short term violent events or periods of 'crisis', since this creates a distorted perception of sexualized violence and taps into preconceptions about sexualized violence that have been identified as deeply problematic (see above).

In summary, it can be observed that following over five decades of little interest, active downplaying and emphasis on ritual interpretations by many post-World War II researchers, violence in prehistoric societies has become a major subject of interest in the last three decades. Still, there seems to be a persistent urge to prove, that violence existed in prehistoric societies. Rather, violence should be understood as part of the diverse spectrum of human social interactions, which can be conceptualized ranging between de-escalation and escalation, although these do not always need to be conscious choices. The concrete detection of sexualized violence in the archaeological record is difficult and research should not be limited to short term violent events and crisis related 'chaotic' violence. However, the implicit inclusion of sexualized violence in archaeological narratives creates a picture of the past — in this case of the Neolithic — that is ostensibly 'clean' but carries an ugly implicit burden and facilitates the stigmatization of sexualized violence in general.

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REFERENCES

Armit, I., Knüsel, C., Robb, J. and Schulting, R., 2006. Warfare and Violence in Prehistoric Europe. An Introduction. *Journal of Conflict Archaeology* 2(1), 1–12. https://www.jstor.org/stable/48601904

Armit, I., 2011. Violence and Society in the Deep Human Past. *The British Journal of Criminology* 51(3), 499–517. https://doi.org/10.1093/bjc/azq076.

Arponen, V.P.J., Müller, J., Hofmann, R., Furholt, M., Ribeiro, A., Horn, C. and Hinz, M., 2016. Using the Capability Approach to Conceptualise Inequality in Archaeology. The Case of the Late Neolithic Bosnian Site Okolište *c.* 5200–4600 BCE. *Journal of Archaeological Method and Theory* 23(2), 541–560. https://doi.org/10.1007/s10816-015-9252-0

Baray, L., Guilaine, J. and Dias-Meirinho, M.-H., eds., 2011. *L'armement et l'image du guerrier dans les sociétés anciennes. De l'objet à la tombe. Actes de la Table ronde internationale et interdisciplinaire, Sens, CEREP, 4–5 juin 2009*. Dijon: Éditions universitaires de Dijon.

Bickle, P., 2020. Thinking Gender Differently: New Approaches to Identity Difference in the Central European Neolithic. Cambridge *Archaeological Journal* 30(2), 201–218. Available from: https://doi.org/10.1017/S0959774319000453

Bickle, P. and Hofmann, D., 2022. Female Mobility Patterns in prehistory: Patrilocality, descent and kinship of the Linearbandkeramik (LBK). *In:* R.-M. Arbogast, A. Denaire, S. Grando-Valeckova, P. Lefranc, M. Mauvilly and S. van Willigen, eds. *D'Oberlarg à Wesaluri, itinéraire d'un préhistorien. Mélanges offerts à Christian Jeunesse*. Strasbourg: Association pour la Valorisation de l'Archéologie du Grand Est, 105–122.

Blank, M., 2017. Bronze Age burials in megalithic graves in Falbygden. *In:* S. Bergerbrant and A. Wessman, eds. *New perspectives on the Bronze Age. Proceedings of the 13th Nordic Bronze Age Symposium held in Gothenburg 9th to 13th June 2015*. Oxford: Archaeopress, 19–36.

Blank, M., Sjögren, K.-G. and Storå, J., 2020. Old bones or early graves? Megalithic burial sequences in southern Sweden based on ^{14}C datings. *Archaeological and Anthropological Sciences* 12(4), 1–33.

Bunnefeld, J.-H., 2018. The chief and his sword? Some thoughts on the swordbearer's rank in the Early Nordic Bronze Age. *In: Horn and Kristiansen 2018*, 198–212.

Cameron, C.M., 2011. Captives and Culture Change. *Current Anthropology* 52(2), 169–209.

Cameron, C.M., 2016. *Captives. How Stolen People Changed the World*. London: University of Nebraska Press.

Cavazzuti, C., Hajdu, T., Lugli, F., Sperduti, A., Vicze, M., Horváth, A., Major, I., Molnár, M., Palcsu, L. and Kiss, V., 2021. Human mobility in a Bronze Age Vatya 'urnfield' and the life history of a high-status woman. *PLoS ONE* 16(7). https://doi.org/10.1371/journal.pone.0254360

David-Elbiali, M., 2011. À la recherche du guerrier dans les sépultures du Bronze ancien et moyen (2200–1300 av. J.-C.) en Europe Centre-occidentale et en Italie du Nord. *In: Baray et al. 2011*, 189–224.

Dolfini, A., Crellin, R.J., Horn, C. and Uckelmann, M., eds. 2018. *Prehistoric Warfare and Violence: Quantitative and Qualitative Approaches*. Cham: Springer.

De Dreu, C.K.W., Gross, J., Méder, Z. and Columbus, S., 2016. In-group defense, out-group aggression, and coordination failures in intergroup conflict. *PNAS* 113(38), 10524–10529. https://doi.org/10.1073/pnas.1605115113

Dyer, M. and Fibiger, L., 2017. Understanding blunt force trauma and violence in Neolithic Europe: the first experiments using a skin-skull-brain model and the Thames Beater. *Antiquity* 91(360), 1515–1528.

Fibiger, L., Ahlström, T., Bennike, P. and Schulting, R.J., 2013. Patterns of violence-related skull trauma in Neolithic Southern Scandinavia. *American Journal of Physical Anthropology* 150(2), 190–202.

Fibiger, L., Ahlström, T., Meyer, C. and Smith, M., 2023. Conflict, violence, and warfare among early farmers in Northwestern Europe. *PNAS* 20(4), 1–9.

Fontijn, D., 2021. *Give Peace a chance – on violence and warfare in prehistory and why it matters*. Drieenveertigste Kroon-Voordracht. Amsterdam: Drukkerij J. Bout & Zn., Huizen.

Frei, K.M., Mannering, U., Kristiansen, K., Allentoft, M.E., Wilson, A.S., Skals, I., Tridico, S., Nosch, M.L., Willerslev, E., Clarke, L. and Frei, R., 2015. Tracing the dynamic life story of a Bronze Age Female. *Nature. Scientific reports* 5(1). https://doi.org/10.1038/srep10431

Frei, K.M., Villa, C., Jørkov, M.L., Allentoft, M.E., Kaul, F., Ethelberg, P., Reiter, S.S., Wilson, A.S., Taube, M., Olsen, J., Lynnerup, N., Willerslev, E., Kristiansen, K. and Frei, R., 2017. A matter of months: High precision migration chronology of a Bronze Age female. *PLoS ONE* 12(6).

Furholt, M., 2018. Massive Migrations? The Impact of Recent aDNA Studies on our View of 3rd Millennium Europe. *European Journal of Archaeology* 21(2), 159–191.

Furholt, M., 2020a. Biodeterminism and pseudo-objectivity as obstacles for the emerging field of archaeogenetics. *Archaeological Dialogues* 27(1), 23–25. https://doi.org/10.1017/S1380203820000057

Furholt, M., 2020b. Social Worlds and Communities of Practice: a polythetic culture model for 3rd millennium BC Europe in the light of current migration debates. *In:* A. Caraglio and M. Bailly, eds. Identité? Prestige? Quoi d'autre? Renverser les idées reçues sur la diffusion du Campaniforme en Europe à la fin du 3e millénaire av. n. è. [Ethnicity? Prestige? What else? Challenging views on the spread of Bell Beakers in Europe during the late 3rd millennium BC.]. *Préhistoires méditerranéennes* 8, 1–24.

Gaydarska, B., Rebay-Salisbury, K., Ramírez Valiente, P., Fries, J.E., Hofmann, D., Augereau, A., Chapman, J., Mina, M., Pape, E., Ialongo, N., Nordholz, D., Bickle, P., Haughton, M., Robb, J. and Harris, O., 2023. To Gender or not To Gender? Exploring Gender Variations through Time and Space. *European Journal of Archaeology* 26(3), 271–298. https://doi:10.1017/eaa.2022.51

Gerger, H., Kley, H., Bohner, G. and Siebler, F., 2007. The acceptance of modern myths about sexual aggression scale: development and validation in German and English. *Aggressive behavior* 33(5), 422–440.

Guilaine, J. and Zammit, J., 2005. *The origins of war. Violence in prehistory*. Malden: Blackwell Publishing.

Haak, W., Lazaridis, I., Patterson, N., Rohland, N., Mallick, S., Llamas, B., Brandt, G., Nordenfelt, S., Harney, E., Stewardson, K., Fu, Q. Mittnik, A., Bánffy, E., Economou, C., Francken, M., Friederich, S., Pena, R.G., Hallgren, F., Khartanovich, V., Khokhlov, A., Kunst, M., Kuznetsov, P., Meller, H., Mochalov, O., Moiseyev, V., Nicklisch, N., Pichler, S.L., Risch, R., Rojo Guerra, M.A., Roth, C., Szécsényi-Nagy, A., Wahl, J., Meyer, M., Krause, J., Brown, D., Anthony, D., Cooper, A., Alt, Kurt W. and Reich, D., 2015. Massive migration from the steppe was a source for Indo-European languages in Europe. *Nature* 522(7555), 207–211. https://doi.org/10.1038/nature14317

Hansen, C.W., Jensen, P.S. and Skovsgaard, C.V., 2015. Modern gender roles and agricultural history: the Neolithic inheritance. *Journal of Economic Growth* 20(4), 365–404. https://doi.org/10.1007/s10887-015-9119-y

Herrmann, F. and Klocke, V., 2020. „Stop Portraying Rape". Die Inszenierung von sexualisierter Gewalt im Film. *ffk Journal* 5, 61–72. https://doi.org/10.25969/mediarep/13758

Hobbes, T., 1651. *Leviathan, or, The matter, form, and power of a common-wealth ecclesiastical and civil*. London: Printed for Andrew Crooke.

Horn, C. and Kristiansen, K., eds., 2018. *Warfare in Bronze Age society*. Cambridge: Cambridge University Press.

Iversen, R., 2019. On the emergence of Corded Ware societies in northern Europe: Reconsidering the migration hypothesis. *In:* B.A. Olsen, T. Olander and K. Kristiansen, eds. *Tracing the Indo-Europeans. New evidence from archaeology and historical linguistics*. Oxford: Oxbow Books, 73–95.

Keeley, L.H., 1996. *War before civilization. The myth of the peaceful savage*. New York, Oxford: Oxford University Press.

Kennedy, A.C. and Prock, K.A., 2018. "I Still Feel Like I Am Not Normal": A Review of the Role of Stigma and Stigmatization Among Female Survivors of Child Sexual Abuse, Sexual Assault, and Intimate Partner Violence. *Trauma, Violence & Abuse* 19(5), 512–527.

Knüsel, C. and Smith, M.J., eds., 2019. *The Routledge Handbook of the Bioarchaeology of Human Conflict*. London: Routledge.

Krahé, B., 2016. Societal Responses to Sexual Violence Against Women: Rape Myths and the "Real Rape" Stereotype. *In:* H. Kury, S. Redo and E. Shea, eds. *Women and children as victims and offenders. Background, prevention, reintegration: suggestions for succeeding generations*. Switzerland: Springer International Publishing.

Kristiansen, K., 1999. The emergence of warrior aristocracies in later European prehistory and their long-term history. *In:* J. Carman and A. Harding, eds. *Ancient warfare. Archaeological perspectives*. Gloucestershire: Sutton, 175–189.

Kristiansen, K., Price, T.D., Frei, K.M., Pospieszny, Ł., Iversen, R., Johannsen, N.N., Sjögren, K.-G. and Kroonen, G., 2017. Re-theorising mobility and the formation of culture and language among the Corded Ware Culture in Europe. *Antiquity* 91(356), 334–347.

Macintosh, A.A., Pinhasi, R. and Stock, J.T., 2017. Prehistoric women's manual labor exceeded that of athletes through the first 5500 years of farming in Central Europe. *Science advances* 3(11), eaao3893. https://www.science.org/doi/10.1126/sciadv.aao3893

Meyer, C., Kürbis, O., Dresely, V. and Alt, K.W., 2018. Patterns of Collective Violence in the Early Neolithic of Central Europe. *In: Dolfini et al. 2018*, 21–38.

Müller, J., Bilotti, G., Skorna, H., Wilkes, F., Kruckenberg, C., Duffy, P., Hofmann, R. and Kneisel, J., 2024. The monopolisation of violence: booms and busts of prehistoric violence linked to social inequalities. *Research Square: Preprint*. https://doi.org/10.21203/rs.3.rs-4904279/v1

Müller-Scheeßel, N., Hukeľová, Z., Meadows, J., Cheben, I., Müller, J. and Furholt, M., 2021. New burial rites at the end of the Linearbandkeramik in south-west Slovakia. *Antiquity* 95(379), 65–84.

Nakoinz, O., Kneisel, J. and Gorbahn, H., 2019. Competition and Conciliation: Modelling and Indicating Prehistoric Conflicts. *In:* S. Hansen and R. Krause, eds. *Materialisierung von Konflikten. Beiträge der Dritten Internationalen LOEWE-Konferenz vom 24. bis 27. September 2018 in Fulda [Materialisation of conflicts. Proceedings of the Third International LOEWE Conference, 24–27 September 2018 in Fulda]*. Bonn: Habelt, 1–12.

Olalde, I., Brace, S., Allentoft, M.E., Armit, I., Kristiansen, K., Rohland, N., Mallick, S., Booth, T., Szécsényi-Nagy, A., Mittnik, A., Altena, E., Lipson, M., Lazaridis, I., Patterson, N.J., Broomandkhoshbacht, N., Diekmann, Y., Faltyskova, Z., Fernandes, D.M., Ferry, M., Harney, E., de Knijff, P., Michel, M., Oppenheimer, J., Stewardson, K., Barclay, A., Alt, K.W., Avilés Fernández, A., Bánffy, E., Bernabò-Brea, M., Billoin, D., Blasco, C., Bonsall, C., Bonsall, L., Allen, T., Büster, L., Carver, S., Castells Navarro, L., Craig, O.E., Cook, G.T., Cunliffe, B.W., Denaire, A., Dinwiddy, K. E., Dodwell, N., Ernée, M., Evans, C., Kuchařík, M., Francès Farré, J., Fokkens, H., Fowler, C., Gazenbeek, M., Garrido Pena, R., Haber-Uriarte, M., Haduch, E., Hey, G., Jowett, N., Knowles, T., Massy, K., Pfrengle, S., Lefranc, P., Lemercier, O., Lefebvre, A., Lomba Maurandi, J., Maj, T., McKinley, J.I., McSweeney, K., Balázs Gusztáv, M., Modi, A., Kulcsár, G., Kiss, V., Czene, A., Patay, R., Endrődi, A., Köhler, K., Hajdu, T., Cardoso, J.L., Liesau, C., Parker Pearson, M., Włodarczak, P., Price, T.D., Prieto, P., Rey, P.-J., Ríos, P., Risch, R., Rojo Guerra, M.A., Schmitt, A. Serralongue, J., Silva, A.M., Smrčka, V., Vergnaud, L., Zilhão, J., Caramelli, D., Higham, T., Heyd, V., Sheridan, A., Sjögren, K.-G., Thomas, M.G., Stockhammer, P.W., Pinhasi, R., Krause, J., Haak, W., Barnes, I., Lalueza-Fox, C. and Reich, D., 2018. The Beaker phenomenon and the genomic transformation of northwest Europe. *Nature* 555, 190–208.

Otterbein, K.F., 2000. Killing of Captured Enemies: A Cross-cultural Study. *Current Anthropology* 41(3), 439–443.

Otto, T., Thrane, H. and Vandkilde, H., eds., 2006. *Warfare and society. Archaeological and social anthropological perspectives*. Aarhus: Aarhus Univ. Press.

Papac, L., Ernée, M., Dobeš, M., Langová, M., Rohrlach, A.B., Aron, F., Neumann, G.U., Spyrou, M.A., Rohland, N., Velemínský, P., Kuna, M., Brzobohatá, H., Culleton, B., Daněček, D., Danielisová, A., Dobisíková, M., Hložek, J., Kennett, D.J., Klementová, J., Kostka, M., Krištuf, P., Kuchařík, M., Hlavová, J.K., Limburský, P., Malyková, D., Mattiello, L., Pecinovská, M., Petriščáková, K., Průchová, E., Stránská, P., Smejtek, L., Špaček, J., Šumberová, R., Švejcar, O., Trefný, M., Vávra, M., Kolář, J., Heyd, V., Krause, J.,

Pinhasi, R., Reich, D., Schiffels, S. and Haak, W., 2021. Dynamic changes in genomic and social structures in third millennium BCE Central Europe. *Science advances* 7(35), eabi6941. https://www.science.org/doi/10.1126/sciadv.abi6941

Parker Pearson, M. and Thorpe, I.J., eds., 2005. *Warfare, violence and slavery in prehistory. Proceedings of a Prehistoric Society conference at Sheffield University*. Oxford: British Archaeological Reports.

Penezić, K., Porčić, M., Urban, P.K., Wittwer-Backofen, U. and Stefanović, S., 2020. Stressful times for women – Increased physiological stress in Neolithic females detected in tooth cementum. *Journal of Archaeological Science* 122, 105217. https://doi.org/10.1016/j.jas.2020.105217

Peter-Röcher, H., 2018. Krieg in prähistorischer Zeit: Fakten und Fiktionen. *In:* S. Hansen and R. Krause, eds. *Bronzezeitliche Burgen zwischen Taunus und Karpaten. Beiträge der Ersten Internationalen LOEWE-Konferenz vom 7. bis 9. Dezember 2016 in Frankfurt/Main [Bronze Age hillforts between Taunus and Carpathian mountains. Proceedings of the First International LOEWE Conference, 7–9 December 2016 in Frankfurt/Main]*. Bonn: Habelt, 67–81.

Peter-Röcher, H., 2023. Gewalt gegen Lebende – Gewalt an Toten: zu Kontexten und Interpretationsmöglichkeiten menschlicher Überreste in der Linearbandkeramik. *In:* N. Balkowski, K.P. Hofmann and I.A. Hohle, eds. *Mensch – Körper – Tod. Der Umgang mit menschlichen Überresten im Neolithikum Mitteleuropas*. Leiden: Sidestone, 119–136.

Pinker, S., 2011. *The better angels of our nature. Why violence has declined*. New York: Penguin Books.

Reiter, S.S., Frei, K.M., Nørgaard, H.W. and Kaul, F., 2019. The Ølby Woman. A Comprehensive Provenance Investigation of an Elite Nordic Bronze Age Oak-Coffin Burial. *Danish Journal of Archaeology* 8, 1–22.

Robb, J. and Harris, O.J.T., 2018. Becoming Gendered in European Prehistory: Was Neolithic Gender Fundamentally Different? *American Antiquity* 83(1), 128–147. https://doi:10.1017/aaq.2017.54

Rousseau, J.-J., 1761. *A discourse upon the origin and foundation of the inequality among mankind*. London: Printed for R. and J. Dodsley.

Ryan-Despraz, J., 2022. *Practice and Prestige. An Exploration of Neolithic Warfare, Bell Beaker Archery, and Social Stratification from an Anthropological Perspective*. Oxford: Archaeopress.

Schulting, R.J. and Wysocki, M., 2005. 'In this Chambered Tumulus were Found Cleft Skulls …'. An Assessment of the Evidence for Cranial Trauma in the British Neolithic. *Proceedings of the Prehistoric Society* 71, 107–138.

Teschler-Nicola, M., 2012. The Early Neolithic site Asparn/Schletz (Lower Austria). Anthropological evidence of interpresonal violence. *In:* R. Schulting, R.J. Schulting and L. Fibiger, eds. *Sticks, stones, and broken bones. Neolithic violence in a European perspective*. Oxford: Oxford University Press, 101–120.

Tornberg, A., 2022. A prehistory of violence: Evidence of violence related skull trauma in southern Sweden, 2300–1100 BCE. *In:* A. Tornberg, A. Svensson and J. Apel, eds. *Life and afterlife in the Nordic Bronze Age. Proceedings of the 15th Nordic Bronze Age Symposium held in Lund, Sweden, June 11–15, 2019*. Lund: Media-Tryck, 99–118.

Tung, T.A., 2021. Making and Marking Maleness and Valorizing Violence. *Current Anthropology* 62(S23), 125–144.

Vandkilde, H., 2003. Commemorative Tales. Archaeological Responses to Modern Myth, Politics, and War. *World Archaeology* 35(1), 126–144. https://doi.org/10.1080/0043824032000079189

Vandkilde, H., 2006. Warriors and Warrior Institutions in Copper Age Europe. *In: Otto et al. 2006*, 355–384.

Vandkilde, H., 2018. Body aesthetics, fraternity and warfare in the long European Bronze Age: Postscriptum. *In: Horn and Kristiansen 2018*, 229–243.

Western, A.G. and Hurst, J.D., 2019. 'Soft Heads'. Evidence for sexualized warfare during the later Iron Age from Kemerton Camp, Bredon Hill. *In: Knüsel and Smith 2019*, 161–184.

Power and Coercion in the Neolithic and Bronze Age of Western Eurasia

Martin Furholt

KEYWORDS: *power, coercion, European Neolithic, European Bronze Age*

Abstract

This paper criticizes the widespread understanding of power in prehistoric archaeology, especially the use of Max Webers definition with its individualist, confrontational and statist bias. It is argued that this understanding of power ultimately rests upon the possibility of coercion, or even a monopoly of coercive violence. However, anthropological knowledge and the archaeological record strongly suggest that the possibilities for coercion, and more so the possibilities of monopolizing coercive force were much more limited during most of human history than it is in the modern world. This leads to a re-evaluation of the development of social organisation in Western Eurasian Prehistory.

Zusammenfassung

Dieser Aufsatz setzt sich kritisch mit dem in der prähistorischen Archäologie weit verbreiteten Machtbegriff auseinander, und zwar besonders mit der auf Max Weber aufbauenden Definition mit ihrer individualistischen, konfrontativen und auf staatliche Gesellschaften gründenden Schlagseite. Es wird argumentiert, dass dieser Machtbegriff letztlich die Möglichkeit von Zwang voraussetzt, ja sogar eines Gewaltmonopols bedarf. Jedoch legen sowohl anthropologische Quellen, wie auch der archäologische Befund deutlich nahe, dass die Möglichkeiten einer Zwangsausübung, und viel mehr noch einer Monopolisierung von Gewalt während des größten Teils der Menschheitsgeschichte wesentlich begrenzter waren als in der modernen, weitgehend staatlich verfassten Welt. Diese Diskussion führt schließlich zu einer Neuevaluation der Entwicklung der sozialen Organisation in der Urgeschichte des westlichen Eurasiens.

In most cases, when archaeologists talk about power, they actually mean coercive domination (Furholt 2021a; Lund *et al.* 2022). Although the definitions of *power* vary, the underlying idea characterizing most of them is one that sees power as individualist, self-interested and confrontative (Lund *et al.* 2022). This is best exemplified by the most influential of definitions, the one laid out by Max Weber. Weber was a brilliant, systematic thinker, but, having grown up in 19th century Germany, also well exemplified the nation-statist intellectual straight-jacket in which he was raised. To him, power was

"*… jede Chance, innerhalb einer sozialen Beziehung den eigenen Willen auch gegen Widerstreben durchzusetzen, gleichviel worauf diese Chance beruht*"
(Weber 1922, I. §16)

"*… every possibility within a social relationship to push through one's own will even against resistance, no matter on what this possibility rests*" (translation by author).

Power seen this way is inherently about imposing your will on someone else. And although Weber did acknowledge that what this power is based on might be non-violent, most of what follows concentrates on the forms of *Herrschaft*, which he largely sees as universal. The German word *Herrschaft*, unfortunately, does not translate well into English, and I think this is a big source of the confusion. Semantically, the word "*Herr*" means master, revealing its close connection with patriarchy. But it is best translated as either coercive rule or domination. It is a kind of power expressed in command-obedience relationships, something that seemed natural and was part of daily experience for Weber and his contemporaries in Europe but is unknown in many societies around the world (Evans-Pritchard 1940; Sigrist 1967; Clastres 1989; 1994; Graeber 2004; Graeber and Wengrow 2021; Amborn 2019). Weber explicitly believed that *Herrschaft* permeated all kinds of social relations, from 'erotic relationships to scholarly discussions' (Allen 2017, 98). Such a worldview would today be termed psychopathic by most, but it probably well represented the personal experiential background in the society in which Max Weber was raised.

What is obvious is that Weber's definition of power is defined in, and with respect to, a modern nation-state context, in which the self-interested individual is the main actor and such power relations are ultimately secured by a monopoly on coercive force, represented by the state. It is also formulated in a modern capitalist context, in which individuals are pitched against each other as competitors and societal solidarity is downplayed. In a stateless society, where such a monopoly did not exist, power must have worked differently. It would probably have been possible to impose coercive power or domination on a group of people, but when that domination was put to the test, what would it ultimately be built on? You can charm or bribe a few bullies to subdue opposition, but it only takes an equal number of people organising in opposition for those people to have a fair chance of toppling your rule. Indeed, Charles Stanish (2017) has demonstrated, by going through the ethnographic accounts of chiefs in non-state contexts, that such chiefs generally do not have coercive power at all, contrary to what the individuals themselves might have claimed. This means that Weberian *Herrschaft* is not very likely to have existed in European prehistory. We thus need to seriously question our view on Neolithic or Bronze Age chiefs.

More fundamentally, however, to see humans as individuals pitched against each other heavily misrepresents the lived realities of people around the world, past and present. It ignores the fundamentally cooperative nature of human sociality (Tomasello 2009; Apicella and Silk 2019). Surely, the kind of aggrandising behaviour that Weber had in mind in his power definition does and did exist, but it is an optional kind of behaviour, while cooperation and living along a set of shared norms and values structuring and enabling collective action are necessities, without which there is no society.

To properly represent this in our narratives of the past, however, we need a different understanding of power than the Weberian domination-as-power concept. Here, Pierre Clastres' writings of non-coercive power come to mind (Clastres 1989; 1994), but, as laid out elsewhere (Furholt 2021a; Lund *et al.* 2022), Hannah Arendt's concept of power as collective consensus (Arendt 1970) provides a more insightful and inspiring alternative. Herrmann Amborn (2019), using Arendt's concept of power, has demonstrated that in those societies with a non-state form of social organisation he studied at the Horn of Africa, the key to a functioning society was not coercive force, but a strong, collectively well-internalised set of rules and norms. Such a set of rules and norms exists in every society, state or non-state, and confirms the strength of Arendt's power concept. Power, in her view, is the collective consensus about what is the right way in which to act and interact, and thus the essence of sociality. Without such a collective power, there is no society. More importantly, for Arendt, power and violence are opposite forces (Arendt 1970, 41). Violence destroys power because it leaves no room for dialogue and undermines the underlying consensus. As in Weber's definition, it crushes the opponent's agency instead of engaging with that opponent. On the other hand, the more power there is, the less place there is for violence. Power is connectivity; violence is its enemy. Yet, in real life, throughout history, stresses Arendt, they are always co-occurring, albeit in an inverted relationship (Arendt 1970, 42). The most democratic and solidaric societies would be the ones in which violence plays only a very marginal role, but, according to Arendt, it is not totally absent. For example, in Hermann Amborn's (2019) case studies of acephalous societies, while legal and juridical matters would usually be settled by consensus and preferably by rehabilitation, compensation for damage and forgiveness of wrongdoing, there is also the last-resort — albeit seldom-applied — possibility of expulsion or even execution of a person absolutely unwilling to abide by the rules set up through social consensus. On the other extreme end, one individual with access to an almighty weapon or a monopoly on violence could coerce everyone else into obedience, which would leave us in a situation of coercive domination or, in modern terms, authoritarian despotism — and (close to) no power. But this almighty weapon likely has to be maintained by someone, and the ability to have a monopoly on coercive force also depends on people carrying out the coercion. In other words, there needs to be some degree of

collective consensus supporting the dominator; in that way, the dominator depends on power in Arendt's sense to some degree. Yet, the possibility to perpetrate violence and to muster and monopolise the use of violence is a crucial parameter separating an egalitarian democracy from authoritarian despotism. Arendt herself makes the point that because violence is an instrumental force (Arendt 1970, 42), the weapons technology that is potentially available plays a decisive role in the possibility to enforce coercive domination at the expense of collective power.

VIOLENT TECHNOLOGIES

One striking pattern in prehistoric artefacts is that clearly specialised weapons or tools made or optimised for the sole purpose of injuring or killing another human the most effectively are absent for most of human history. The use of such a tool is to be differentiated from the use of a tool that was originally designed and used for, say, hunting (spear, bow and arrow, dagger), fishing (mace head) or woodworking (axe) (see also the weapon-tools and tool-weapons terminology introduced by Chapman 1999). Certainly, these are often used as a weapon, but it makes a big difference whether people use everyday tools for violent purposes or whether they put their thoughts and energy into designing better and more efficient killing instruments. The fact that people did not do the latter for most of prehistory is even more remarkable given the prevalence and elaboration of weapons since the Bronze Age and — most egregiously — today. The first clear and uncontentious specialised weapon is the sword, the first specimens of which are found just after 3500 BCE at the Anatolian site of Arslantepe (Frangipane 2010). Around the same time, halberds — *i.e.* daggers shafted like an axe — appear in the archaeological record in several places in Europe (Horn 2014). Those, especially early flint specimens, are a little less straightforward to identify, and thus should be seen as less uncontentious than a sword. Still, and importantly, they attest to the same purpose achieved by the invention of the sword, namely using a dagger blade at a longer distance from one's own body. While a mace head is being depicted in use as a weapon in late predynastic Egypt (Joffe 2000), the earliest mace heads are associated with coastal Mesolithic sites (Biermann 2015), thus suggesting that their original function was connected to killing fish. They also do not strike me as especially effective weapons against other humans.

Another potential specialised weapon is the shaft-hole axe, or battle axe. Here the situation is very complicated and has been made more unclear through recent research. First of all, not all shaft-hole axes are to be seen as battle axes. Since the Late Neolithic (*i.e.* the first half of the 5th millennium BCE), more slender versions of shaft-hole axes appear in burials in the Carpathian Basin, with a clear tendency to be placed in male burials rather than female ones (Zalai-Gaál *et al.* 2012). This fact, and the idea of the 'battle axe' itself, was enough to convince most archaeologists that battle axes represent the first specialised weapon. This has been a powerful idea, as those slender shaft-hole axes become prevalent in the second half of the 4th millennium – in tandem with the halberds and daggers also often depicted together on stelae found throughout western Eurasia. A clear uptick in the late 4th millennium BCE (Schultrich 2021) and battle axes then being the signature item of the newly emerging warrior persona in Corded Ware burials during the 3rd millennium seemed to make a coherent argument. However, recent work on the actual use of these axes has seriously questioned the idea of them being specialised weapons at all. Catherine Frieman (2012) and Karsten Wentink (2020) have pointed to the heavy use wear on the Scandinavian Funnel Beaker (Frieman 2012) and Dutch Corded Ware (Wentink 2020) battle axes. By replicating the alleged activities — smashing in pigs heads to simulate use as a weapon, felling a tree or uprooting tree trunks — Karsten Wentink (2020) was able to determine that only the latter activity results in the kinds of use wear found on the axes, being caused by repeatedly hitting a combination of wood and earth. Indeed, with their round shaft hole of small diameter, those 'battle axes' are as ergonomically unfit to serve as effective weapons as they are to fell a tree (Wentink 2020, 122), as the stone axe is too heavy for any sideways motion involving chops or blows. On top of that, because of the circular shaft hole, if such an axe hits something solid in just a slightly decentral position, it will rotate to the side. It does, however, serve nicely for is a precise, controlled, downward chopping motion performed without too much force, such as the cutting of roots from a dug-out tree trunk. With other words, as Karsten Wentink (2020) suggests, the 'battle axe' is a specialised wood-working tool used in an important agricultural activity, the uprooting of trees — one that becomes more important after the invention of the plough and the ability to work larger fields. To me, this could explain both the proliferation of shaft-hole axes after 3500 BCE and the prominent social role these axes were afforded in Corded Ware graves. Such a reading would, however, also significantly de-militarise the 3rd millennium BCE.

Obviously, many more such use-wear studies would be needed to come to such far-reaching conclusions, and we also do not yet know if the same interpretation can be applied to the 5th millennium BCE shaft-hole axes from the Carpathian and Balkan regions mentioned earlier. However, it does remove the so-called battle axes from the list of undisputed specialised weapons. Removing them from the list makes a lot of sense anyway, as they would not really represent a more forceful or efficient weapon in any case. And most importantly, again, in the known mass depositions of people violently killed from the 6th millennium BCE (see below) or from the 3rd millennium BCE — such as the Globular Amphora burial of Koszyce (Schroeder *et al.* 2019; Włodarczak *et al.* 2021) or that of Eulau (Haak *et al.* 2008; Muhl *et al.* 2010) — the shape of the skeletal trauma, in those cases where it can be established, clearly points towards adzes, flat axes, arrows or blunt force, but not towards those shaft-hole axes. It does seem that it is our prejudice that makes us view this tool as a weapon, as there is no hard evidence backing this claim. Why should a prestigious male persona in a Corded Ware burial not refer to an effective farmer or the axes on the stelae mentioned above not symbolise agricultural prowess?

Daggers may of course also have initially served as a hunting tool, although here I mention only their enhancement in the form of halberds and swords, which clearly indicates an intentionally improved weapons function. It is only swords, and eventually the combination of swords and protective gear, such as helmets and shields — as well as the association of those items with bronze spears and lances — that indicate that a threshold has been crossed towards a technology that is intentionally and primarily designed to give its wielder a decisive advantage in combat. This observation is crucial in light of the properties of power discussed above. In order to be able to overwhelm power by violence, an imbalance in the possibilities to mobilise violence is needed. This can be achieved though assembling a group of thugs or other people willing to overwhelm the common consensus. But during most of prehistory, the playing field is rather even when it comes to that possibility. Every Mesolithic hunter or Neolithic farmer can pick up an axe or a bow and arrow and use if for violent purposes, but that is true for everyone else in the same way. Thus, your possibilities to dominate or coerce someone depend on your ability to muster more followers than your counterpart, which in essence means they depend on power in Arendt's sense — to be able to have the majority support backing your project. However, when specialised weapons, armour and the necessary combat training come into play, in combination with fortified hilltop sites or complex stone wall constructions, the possibilities for creating such an imbalance of coercive possibilities are significantly enhanced. Thus, we have to assume that at least up until the 4th millennium BCE, the possibilities for violent coercion and thus domination were structurally restricted. I do not want to argue that domination did not occur prior to this date (in fact, I will discuss an example below) — only that it would have been impeded by the structural social and technological setting.

AN ALTERNATIVE HISTORY OF VIOLENCE AND POWER

We know that prehistory was not a peaceful paradise (Keeley 1996; Fibiger *et al.* 2023). Yet, incidences of homicide aside, evidence for mass killings, the iconic representations thereof and the invention of specialised weapons are at the current state of knowledge absent from the archaeological record of well over 200 millennia of history of anatomically modern humans (Ferguson 2013b; Risch 2015). It really deserves to be emphasised: Despite the creativity and ingenuity of the human mind when it comes to inventing new technologies or improving on existing technological solutions, it never occurred to anyone, over tens of thousands of years, to invest in devices that would give one human being a significant advantage over others in interpersonal combat. The only weapons available were tools developed and optimised for hunting, fishing, woodworking and comparable activities. This stands in stark contrast to the investment in such weapon technologies since the Bronze Age, let alone today.

War did not appear with the first human, as is often claimed; it is clearly a phenomenon emerging at a later stage, sporadically occurring since a beginning that is probably to be dated in the late Pleistocene or early Holocene (see Ferguson 2013a; 2013b). The earliest archaeological find of a group of people being violently killed comes from the Nile Valley cemetery of Jebel Sahaba, in the Late Palaeolithic of North Africa, around 13 400 BCE, attesting to recurrent episodes of violence, which Isabelle Crevecoeur *et al.* (2021) see as having been triggered by climatic and environmental changes. However, during most of the Early Neolithic in the Middle East, let us say roughly from 9600 to 6500 BCE, there are no such mass burials (Ferguson 2013b; Baten *et al.* 2023). The iconography does not show any interpersonal violence (Risch 2015), and there are also no signs of fortifications, which might indirectly indicate security concerns on the part of those early farmers (Ferguson 2013b; Otterbein 2004).

Actually, during most of the period between 13 000 and 4000 BCE, indications for war are clustered in time and space and are probably connected to periods of crisis or triggered by specific social and environmental conditions (Ferguson 2013b; Meller *et al.* 2024). Importantly, there are extended periods in which there is no or very little evidence of war, even in periods and regions from which it is well known generations earlier or later. Archaeology seems to confirm here what we know from anthropology: Even though violence and war are a human potential, human sociality has a broad spectrum of possibilities to reduce or prevent it. The near-constant state of war that we have gotten used to nowadays is not 'how it has always been' but, rather, a historically specific development.

Urbanisation and political centralisation in the late 4th millennium BCE in the Middle East seem to be decisive here. During this period, in the course of urbanisation, we see what has been called the 'crossing of the military threshold' (Hamblin 2006), where, for the first time, mass graves of hundreds of individuals are found and iconographic evidence shows groups of warriors, acting collectively. At the same time, mythic warrior-kings, such as Gilgamesch in Uruk or Narmer in Egypt, appear. It is no coincidence, I would argue, that this is the period in which the first clearly specialised weapons are found and in which the iconography over the entire region starts depicting armed individuals and scenes of fighting (Risch 2015), as well as scenes of coercion (Pollock and Bernbeck 2000; Reid 2023).

Urbanisation and the establishment of kingdoms in the Middle East constitute an important threshold, as does the appearance of warriors and specialised weapons and their concentration in armies, which, for the first time, allows for the monopolisation of violence. Yet, as we have seen, while there is evidence for war or warlike incidents prior to the 4th millennium BCE, it still takes a long time before such means of coercion became available outside of the early political centres of Mesopotamia and Egypt.

The alternative view of power and its relation to violence as it is advocated here allows us to describe prehistoric societies in a different way. The Early Neolithic in central Europe is a very instructive example, with its remarkable concentration of mass graves and its indications for massacres (Bentley *et al.* 2008; Teschler-Nicola 2012; Duering and Wahl 2014), torture (Meyer *et al.* 2015), and maybe even executions (Meyer *et al.* 2018), mixed up with more complicated structured depositions of weirdly manipulated human bodies, such as at Herxheim (Zeeb-Lanz 2016; Zeeb-Lanz 2019) and Vráble (Furholt *et al.* 2023). Many archaeologists take these finds as evidence for a generally violent Early Neolithic or, more concretely, argue that the Early Neolithic is overall characterised by warfare between Neolithic settlers and Mesolithic groups, as well as warfare between LBK (Linearbandkeramik) communities (Golitko and Keeley 2007). And while the ritual nature of many of those killings and depositions is probably undervalued, it is still worth pointing out that in such cases as Talheim (Bentley *et al.* 2008) and Schletz (Teschler-Nicola 2012), massacres of probably an entire community did occur, which can be clearly classified as war, if not genocide. However, as the late David Fontijn (2021) pointed out, what is remarkable about the high number of signs of violence in the LBK is that they are concentrated during the last century of the Early Neolithic in central Europe, from 5100 to 5000 BCE, whereas there are several centuries prior to and after that violent horizon during which we have the same kinds of societies, the same archaeological archives and conditions for preservation, yet we have no signs of such group-based violence.

In contrast, what we have in the several centuries either side of the 51st century BCE is a system of pronounced inter-regional connectivity, which shows up in the continued uniformity of material culture (Hofmann 2016; Hofmann 2020) and which probably reflects inter-community mobility, such as the exchange of spouses between communities, most likely organised along a kinship system of bilineal descent and bilocality (Ensor 2021). For centuries, communities of the LBK and its successor cultures (Lengyel, SBK, Rössen, *etc.*) managed to live largely peacefully, in a system of transregional cooperation. This fact is all the more significant exactly because this system is contrasted by the period of war in between. That period aside, we are not talking about a totally peaceful life, as rates of lethal trauma on skeletons of up to two per cent in male individuals (Peter-Röcher 2007) show that the picking up of an axe to make one's point did often occur. Yet this level of violence did not significantly interfere with the overall system of cooperation, which rested on a strong sense of shared norms and values, possibly in a similar way as described by Hermann Amborn (2019) for the acephalous societies in the Horn of Africa. It is not the existence of violence that destroys power, but the possibility to create a significant imbalance in the access to violence. As anthropologists have studied in different parts of the world (Clastres 1989; 1994), warfare is a situation in which for practical reasons even egalitarian societies will elect or anoint a temporary leader who will have the power to issue orders and commands — a kind of domination. Even if this is technically directed towards an outside enemy, and should not directly affect the social relations of the in-group outside of the immediate war situation, it obviously poses a threat to the consensus-based power to have a leader commanding a group of warriors returning home from a fight.

A system of inter-community or translocal (Furholt 2018), peaceful relations, as the LBK seems to represent for most of its history, would obviously suffer massively from, let us say, a raid or a massacre by one group of people perpetrated against another. Personal grievances, animosities and the wish for vengeance arising from such a fight would obviously weaken any existing consensus-based power, and would thus likely motivate more violence as a response, which could then turn into as spiral of attack and counter-attack. Thus, it is conceivable to conclude that in the 51st century BCE in central Europe, a system of extended inter-community cooperation based on a stable base of power that had been in place for at least 10 generations (approximately 250 years) deteriorates into a situation in which entire communities are wiped out in the worst possible way, including by the slaying of small children, while marriage partners are taken by force (see also Johanna Brinkmann this volume). As again David Fontijn (2021) made clear, this last point is significant, as it shows how what had earlier been part of a system of peaceful social reproduction though inter-community exchange of spouses is now being turned into a violent act of captive taking and extermination.

The LBK case holds two lessons for us, the first bleak, the second hopeful. The first lesson is that even without the availability of specialised weapons or trained warriors, a system of overall peaceful interaction can spiral into a situation of war, including massacres and extermination. The second lesson is that people in the Early Neolithic period were able to end this slaughter and to re-establish a system of largely peaceful inter-community relations that was similar to what went before, albeit with a slightly different, less supra-regional pattern, as represented by the post-LBK groups after 5000 BCE.

A view of society built on Weber's definition of power as a system in which a number of self-promoting individuals seek to crush everyone else's agency in order to establish a system of command and obedience does not offer a good explanation for the ability of those communities to re-establish peace in a situation without centralised rule. Indeed, the only possibility for arriving at a more peaceful situation under this paradigm would be what is suggested by Thomas Hobbes or, more recently, Steven Pinker (2012), namely to keep down violence by monopolising it in the way Weber describes as a basis for statehood. Such phenomena can probably be studied in the Middle East since the late 4th millennium BCE, where a monopoly over coercive violence was first created — but there, like today, we are not talking about very peaceful societies whatsoever, as attested to by images of violent fights and corporal punishment (Risch 2015; Reid 2023). Steven Pinker's (2012) numbers, on the basis of which he claims a significant reduction in violence in modern times and extremely violent prehistoric times, have since been refuted from several directions (Ferguson 2013a; Dwyer 2021). But what is even more important, I would argue, is that an approach which solely takes into account domination does not help us understand the majority of prehistoric societies in western Eurasia.

Anthropologists interested in war-prevention strategies have studied the details of how the maintenance of peace works in societies without centralised government. Key, again, is the establishment of a collective consensus on a system of values and social norms. Within a community, this means focusing on peaceful and respectful interaction, conciliation and remorse rather than punishment and revenge (Amborn 2019). Between communities, this means focusing on values of interdependence and cooperation manifested though the creation of cross-cutting social ties (Fry 2009), for example through migrating individuals, thereby creating translocal social systems (Furholt 2018). It is important to keep in mind that the existence of such a *collective consensus on a system of values and social norms* is not something we find only in stateless societies; following Arendt, it is the definition of power, it is the essence of all society, it is the essence of what makes society possible.

In order to make war possible, this consensus needs to be degraded by violence, coercion and domination, whether coming from the outside or becoming installed at the very core of the society, such as in child-rearing (DeMause 1974), between spouses (Graeber and Wengrow 2021, 510), or in the form of an authoritarian government (Neitzel and Welzer 2011). The latter can be studied in modern Europe (DeMause 1974; Miller 1990), not least in 19th and early 20th century Germany, the context in which sociologists such as Weber promoted imperial politics between societies and individualistic domination within.

From the LBK example in the 6th millennium BCE, it follows that the breakdown of power and the emergence of war are possible in the absence of specialised weapons, specialised warriors or even any archaeologically visible appreciation of violence in such media as art or other cultural artefacts. But the possibilities for keeping the peace must also have been much better than in the following periods. The possibilities for violent coercion, and thus for the destruction of collective power, significantly rose with the development of specialised weapons and trained warriors in the course of state formation during the late 4th millennium, and those developments were not restricted to the Middle East, but are found since the 3rd millennium BCE in the Mediterranean (Cline 2012; Lull *et al.* 2011) and since the mid-2nd millennium BCE increasingly in central and northern Europe (Earle and Kristiansen 2010;

Kristiansen and Larsson 2005). And indeed, fortifications, weapons and warriors are important concepts during the European Bronze Age (Horn and Kristiansen 2018; Harding 2007), displayed in the burial custom and depicted in iconic art. Battlefields such as the one identified in the valley of the Tollense River in northern Germany (mid-14th century BCE) show that war was waged at least at times in a larger dimension than during the Neolithic (Jantzen *et al.* 2011). However, it is again important to point out the reverse side of this coin. It takes a very long time before the prevalence of the warrior is established outside of Mediterranean Europe, or, to be more precise, given the above discussion about the function of shaft-hole axes, it is currently unclear whether 3rd millennium BCE male graves connected to the Corded Ware and Bell Beaker cultures display warrior, farmer or — following Karsten Wentink (2020) — traveller identities. There are two possibilities for interpretation, depending on how one interprets the function of those tools. The first would be the one I previously favoured (Furholt 2021a; Furholt 2021b; Hofmann *et al.* 2024) — until my more intensive engagement with Karsten Wentink's and Catherine Frieman's work on the use of axes. This previous reading of the evidence would lead to the assumption that those shaft-hole axes are indeed battle axes, and that they are in places misused or even intentionally de-contextualised as an act of political resistance against the 'violence-inequality complex' (Furholt 2021a). The other option is that shaft-hole axes are not specialised weapons but, instead, specialised agricultural tools for the uprooting of trees and other menial but crucially important work related to farming. The level of combat-related injuries on skeletons from this period is not significantly higher than before (Peter-Röcher 2007; Guilaine and Zammit 2008; Pearson *et al.* 2019) — and definitely lower than in the 51st century late LBK context discussed above.

Much points to weapons and warrior identities not yet being widespread in the 3rd millennium BCE; not being connected to the new single-grave custom associated with the Corded Ware, Bell Beaker or Yamnaya cultures (Kaiser 2019); and not being visible in Globular Amphorae contexts (Müller 2023). During this time there are also no signs, either in central Europe or more generally outside of Mediterranean Europe, of political centralisation or any established systems of domination. After decades of trying to find significant differences in the burial equipment of Corded Ware graves (Strahm and Buchvaldek 1991; Buchvaldek and Strahm 1992) that could be interpreted in terms of social or political inequality, we have to acknowledge that such differences do not exist, and that these burials, on the contrary, seem to display a rather egalitarian spirit. While the individual is highlighted through the individualised burial with burial mound (Strahm 2002; Müller 2002; Müller 2023), the mounds are usually of very modest proportions and clustered together in large groups or lines, clearly highlighting the inclusion of individuals into collectives of equals. The same is true for the central European Bell Beaker burials (Vander Linden 2006; Vander Linden 2007), while in Britain, single individuals, such as the Amesbury Archer (Fitzpatrick 2011; Pearson *et al.* 2019), stand out as being over-equipped.

Such a pattern of a few outstandingly rich burials is also found in the Early Bronze Age, where there are what is often labelled as princely graves in central Poland, at Łęki Małe (Czerniak 2008), and in central Germany, at Leubingen and Helmsdorf (Zich 2004), as well as other individual, well-equipped graves in England, such as Bush Barrow (Garrow and Wilkin 2022), and Brittany, such as Plouvorn (Briard 1970). However, from the overall context, it seems rather unlikely that we are dealing here with the graves of chiefs capable of exercising any significant coercive force. Beside being buried with an unusual amount of grave goods, these individuals may also have had access a more protein-rich diet than most of their contemporaries (Knipper *et al.* 2015). But they did not have access to or — apparently — the ability to create an army, such as the rulers of Mesopotamia and Egypt did, and they were not able to establish the kinds of lasting centre, chiefly seat, or outstanding domestic architecture that remotely resemble what we know from their contemporaries in the Middle East and the Mediterranean. Certainly, the existence of 'chiefly halls' has been pointed to in Jutland (Earle 1997), but these are no more than larger versions of the standard houses of the time. Near the princely grave of Leubingen, we are likewise referred to typical post-built houses of slightly larger-than-usual dimensions (Küßner and Wechler 2019), but there is nothing in the architecture that corresponds to those rich princely burials or that would indicate an outstanding social position and wealth of those chiefs during their lifetime. Farther south, Vráble 'Fidvár', in Slovakia (Bátora *et al.* 2009; 2012), one of the most significant Early Bronze Age sites in central Europe, shows clear signs of spatial centralisation, but no princely burials have been located in its vicinity, and no palace-like buildings, which would call for the presence of a chief, have been uncovered thus far. In light of this evidence and the anthropological record presented by Charles Stanish (2017), we have to conclude that Bronze Age chiefs were, largely, charismatic leaders with a high degree of relational wealth or social capital, which allowed them a certain degree of access to a high-protein diet and which motivated their contemporaries to organise a more lavish funeral for them.

Swords, as specialised and more effective weapons, start to appear in larger numbers during the 2nd millennium BCE. Later, helmets, shields and armour start to appear, in connection with a larger number of fortified hilltop sites. Since the Middle Bronze Age, and especially since the Late Bronze Age in temperate Europe, *i.e.* from the mid-2nd millennium onwards, warriors seem to become real — not just heroic ideals, but social forces clearly capable of tipping the scales towards the possibility of a more domination-based social order (albeit this is a complex discussion, see Hansen 2014; Harding 2007; Horn and Kristiansen 2018; Anderson 2018; Wentink 2020; Schulting 2013; Fontijn 2021). Evidence of large-scale warfare also appears in the form of the 14th century Tollense Valley find (Jantzen *et al.* 2011). At this time, iconography displays armed men in large numbers (*e.g.* Ling *et al.* 2018; Horn and Kristiansen 2018), clearly documenting this marked socio-cultural change. Interestingly, however, it is not until the Hallstatt period, in the 8th to 5th centuries BCE, that somewhat centralised systems of domination appear — with the combination of both 'princely graves' and settlements that match this somewhat anachronistic term (Fernández-Götz *et al.* 2014; Krausse *et al.* 2016).

Given the widespread presence of violence and warriors over a period of at least 700 years during the Bronze Age, we have to conclude that the monopolisation of violence necessary for the establishment of coercive domination is not something that readily or frequently happened. And what is more, the system of princely seats and burials established in the Hallstatt period disappears after a few centuries, and those systems of centralised domination are generally volatile throughout history (Thurston 2022). The one-sided attention we archaeologists direct towards centralisation and hierarchisation has led us to undervalue the role, importance and strength of collective power, as well as the possibilities for counter-power and resistance opposing centralisation and monopolisation attempts (Thurston and Fernández-Götz 2021).

CONCLUSION

To sum up, we should acknowledge that the essence of human society is cooperation, mutual aid and solidarity, and that society is held together by a collective consensus about values and norms — power in the sense of Hannah Arendt. Yet the potential for violence and the will to dominate are also human possibilities, which can take — and in history often have taken — the form of coercive domination, oppression and war. However, during most of human existence, there is a situation in which there are single incidences of individual killings, possibly indicating some form of murder, but no evidence for war. Instances of mass killings which could be interpreted as war — such as exist from later periods — are missing, and the rich iconography of the European Upper and Late Palaeolithic periods does not depict any violence (despite unconvincing claims to the opposite, see Guilaine and Zammit 2008; Rauer 2020). And nobody found it important enough to invest in creating specialised, more effective weapons for human-to-human combat. Violence seems to become more frequent in situations of higher population density, climate stress or other crisis-like situations (Meller *et al.* 2024). One blatant example is the concentration of violence and even massacres found in the latest part of the LBK in central Europe. This is a society of people who managed to live together peacefully for many centuries until the collective consensus, power, was broken down, followed by a series of brutal massacres. But then again, collective power seems to have remained strong enough that people were able to restore it even in the aftermath of the worst atrocities. Power and peaceful coexistence also seem to have been much more resilient than usually thought in periods during which violence and weapons technology became more and more sophisticated, starting with the 4th millennium BCE in the Middle East and during the Bronze Age in Europe.

The study of prehistory and history shows that people have always been able to reduce violence and reinstate more power-based social conditions. While this history is complicated, multi-dimensional and non-linear, it does demonstrate that people in the past obviously managed to prevent war from breaking out over extended periods of time, both prior to and after periods of war and increased violence. They managed to prevent despotic rulers from establishing themselves, and they managed to get rid of them once they had arisen. In consequence, we should look to the strategies of peaceful cohabitation and conflict resolution as much as we look to war, and to strategies of self-governance as much as we look to domination, if we, as archaeologists, want to contribute to a better and more just world in the future.

REFERENCES

Allen, K., 2017. *Weber: Sociologist of Empire*. London: Pluto Press.

Amborn, H., 2019. *Law as Refuge of Anarchy: Societies without Hegemony or State*. Cambridge, MA: The MIT Press.

Anderson, K., 2018. Becoming the Warrior: Constructed Identity or Functional Identity? *In:* C. Horn and K. Kristiansen, eds. *Warfare in Bronze Age Society*. Cambridge: Cambridge University Press, 213–228. https://doi.org/10.1017/9781316884522.

Apicella, C.L. and Silk, J.B., 2019. The evolution of human cooperation. *Current Biology* 29(11), R447–R450.

Arendt, H., 1970. On Violence First. San Diego: Harvest.

Baten, J., Benati, G. and Sołtysiak, A., 2023. Violence trends in the ancient Middle East between 12,000 and 400 BCE. *Nature Human Behaviour* 7(12), 2064–2073.

Bátora, J., Eitel, B., Hecht, S., Koch, A. and Rassmann, K., 2009. Fidvár bei Vráble (Kr. Nitra, Südwestslowakei). Untersuchungen auf einem äneolithisch-frühbronzezeitlichen Siedlungshügel. *Germania* 87(1), 1–23.

Bátora, J., Behrens, A., Gresky, J., Ivanova, M., Rassmann, K., Toth, P. and Winkelmann, K.H., 2012. The Rise and Decline of the Early Bronze Age Settlement Fidvár near Vráble, Slovakia. *In:* J. Kneisel, W. Kirleis, M. Dal Corso, N. Taylor and V. Tiedtke, eds. *Collapse or Continuity? Environment and Development of Bronze Age Human Landscapes*, Universitätsforschungen zur prähistorischen Archäologie 205. Bonn: Habelt, 111–130.

Bentley, R.A., Wahl, J., Price, T.D. and Atkinson, T.C., 2008. Isotopic signatures and hereditary traits: snapshot of a Neolithic community in Germany. *Antiquity* 82, 290–304.

Biermann, E., 2015. Keulenköpfe aus Stein – eine kleine Kulturgeschichte der Schagfertigkeit. *In:* H. Meller and M. Schefzig, eds. *Krieg. Eine archäologische Spurensuche*. Halle (Saale): Landesmuseum für Vorgeschichte, 135–138.

Briard, J., 1970. *Les tumulus de l'Age du Bronze de Plouvorn-Plouzévédé (Finistère)*. Paris: Academic Pr.

Buchvaldek, M. and Strahm, C., 1992. Schlussbetrachtung. Die kontinentaleuropäischen Gruppen der Kultur mit Schnurkeramik. *In:* M. Buchvaldek and C. Strahm, eds. *Die kontinentaleuropäischen Gruppen der Kultur mit Schnurkeramik. Schnurkeramik Symposium 1990*, Praehistorica XIX. Prag: Univerzita Karlova, 349–356.

Chapman, J., 1999. The origins of warfare in the prehistory of Central and Eastern Europe. *In:* J. Carman and A. Harding, eds. *Ancient Warfare*. Stroud: Sutton, 101–42.

Clastres, P., 1989. *Society Against the State: Essays in Political Anthropology Revised*. New York: Zone Books.

Clastres, P., 1994. *Archeology of Violence*. Cambridge: MIT Press.

Cline, E.H., ed., 2012. *The Oxford Handbook of the Bronze Age Aegean*. Oxford: Oxford University Press.

Crevecoeur, I., Dias-Meirinho, M.-H., Zazzo, A., Antoine, D. and Bon, F., 2021. New insights on interpersonal violence in the Late Pleistocene based on the Nile valley cemetery of Jebel Sahaba. *Scientific Reports* 11(1), 9991.

Czerniak, L., 2008. Najstarsze społeczności rolnicze. Nowa epoka. *In:* M. Kobusiewicz, ed. *Pradzieje Wielkopolski. Od epoki kamienia do średniowiecza*. Poznań: University of Poznań, 147–201.

DeMause, L., 1974. *The History of Childhood*. New York: Psychohistory Press.

Duering, A. and Wahl, J., 2014. A massacred village community? Agent-based modelling sheds new light on the demography of the Neolithic mass grave of Talheim. *Anthropologischer Anzeiger* 71(4), 447–468.

Dwyer, P., 2021. *Darker Angels of Our Nature: Refuting the Pinker Theory of History & Violence*. London: Bloomsbury Academic.

Earle, T. and Kristiansen, K., eds., 2010. *Organizing Bronze Age Societies: The Mediterranean, Central Europe, and Scandanavia Compared*. New York: Cambridge University Press.

Earle, T.K., 1997. *How chiefs come to power: the political economy in prehistory*. Stanford: Stanford University Press.

Ensor, B.E., 2021. The Not Very Patrilocal European Neolithic: Strontium, Adna, and Archaeological Kinship Analyses. Oxford: Archaeopress.

Evans-Pritchard, E.E., 1940. *The Nuer: A Description of the Modes of Livelihood and Political Institutions of a Nilotic People*. Oxford: Clarendon Press.

Ferguson, R.B., 2013a. Pinker's list: Exaggerating prehistoric war mortality. *In: Fry 2013*, 112–131.

Ferguson, R.B., 2013b. The Prehistory of War and Peace in Europe and the Near East. *In: Fry 2013*, 191–240.

Fernández-Götz, M., Wendling, H. and Winger, K., eds. 2014. *Paths to Complexity: Centralisation and Urbanisation in Iron Age Europe*. Oxford: Oxbow Books.

Fibiger, L., Ahlström, T., Meyer, C. and Smith, M., 2023. Conflict, violence, and warfare among early farmers in Northwestern Europe. *Proceedings of the National Academy of Sciences* 120(4), e2209481119.

Fitzpatrick, A.P., 2011. *The Amesbury archer and the Boscombe bowmen: Bell Beaker burials at Boscombe Down, Amesbury, Wiltshire*. Salisbury: Wessex Archaeology.

Fontijn, D.R., 2021. *Give peace a chance: on violence and warfare in prehistory and why it matters*. Leiden: J.Bout&Zn. https://library.oapen.org/handle/20.500.12657/53280 ; last access 8th January 2024.

Frangipane, M., 2010. The Collapse of the 4th millennium centralised system at Arslantepe and the far-reaching changes in the 3rd millennium societies. *Origini* 34, 237–260.

Frieman, C.J., 2012. *Innovation and Imitation: Stone Skeuomorphs of Metal from 4th–2nd Millennia BC Northwest Europe*. Oxford: Archaeopress.

Fry, D.P., 2009. *Beyond War: The Human Potential for Peace*. 1stedition. Oxford: Oxford University Press Inc.

Fry D.P., ed., 2013. *War, Peace, and Human Nature: The Convergence of Evolutionary and Cultural Views*. Oxford: Oxford University Press. https://doi.org/10.1093/acprof:oso/9780199858996.001.0001

Furholt, M., 2018. Translocal Communities – Exploring Mobility and Migration in Sedentary Societies of the European Neolithic and Early Bronze Age. *Praehistorische Zeitschrift* 92(2), 304–321.

Furholt, M., 2021a. Resisting the 'violence-inequality complex' A new model for third millennium BC mobility in Europe. *In:* V. Heyd, G. Kulcsár and B. Preda-Bălănică, eds. *Yamnaya Interactions. Proceedings of the International Workshop held in Helsinki, 25–26 April 2019, 57–81*. Budapest: Archaeolingua.

Furholt, M., 2021b. Mobility and Social Change: Understanding the European Neolithic Period after the Archaeogenetic Revolution. *Journal of Archaeological Research* 29, 481–535. https://doi.org/10.1007/s10814-020-09153-x

Furholt, M., Cheben, I., Wunderlich, M., Bistakova, A., Fuchs, K., Hukelova, Z., Szilágyi, K. and Kühl, T., 2023. A new peculiar mass deposition of headless human bodies from the LBK settlement in Vráble, SW Slovakia. *The European Archaeologist* 78(Autumn), 47–54.

Garrow, D. and Wilkin, N., 2022. *The World of Stonehenge*. London: British Museum Press.

Golitko, M. and Keeley, L.H., 2007. Beating ploughshares back into swords: warfare in the Linearbandkeramik. *Antiquity* 81(312), 332–342.

Graeber, D., 2004. *Fragments of an Anarchist Anthropology*. 2nd edition. Chicago: The University of Chicago Press.

Graeber, D. and Wengrow, D., 2021. *The Dawn of Everything: A New History of Humanity*. New York: Macmillan USA.

Guilaine, J. and Zammit, J., 2008. *The Origins of War: Violence in Prehistory*. 1st edition. London: Wiley-Blackwell.

Haak, W., Brandt, G., Jong, H.N.D., Meyer, C., Ganslmeier, R., Heyd, V., Hawkesworth, C., Pike, A.W.G., Meller, H. and Alt, K.W., 2008. Ancient DNA, Strontium isotopes, and osteological analyses shed light on social and kinship organization of the Later Stone Age. *Proceedings of the National Academy of Sciences* 105(47), 18226–18231.

Hamblin, W.J., 2006. *Warfare in the Ancient Near East to 1600 BC: Holy Warriors at the Dawn of History*. New Ed. London: Routledge.

Hansen, S., 2014. Der Held in historischer Perspektive. *In:* T. Link and H. Peter-Röcher, eds. *Gewalt und Gesellschaft. Dimensionen der Gewalt in ur- und frühgeschichtlicher Zeit. Internationale Tagung vom 14.–16. März 2013 an der Julius-Maximilians-Universität Würzburg*, Universitätsforschungen zur Prähistorischen Archäologie 259. Bonn: Habelt, 159–168.

Harding, A.F., 2007. *Warriors and Weapons in Bronze Age Europe*. Budapest: Archaeolingua Alapítvány.

Hofmann, D., 2016. Keep on walking: the role of migration in Linearbandkeramik life. *Documanta Praehistorica* 43, 235–251.

Hofmann, D., 2020. Not going anywhere? Migration as a social practice in the early Neolithic Linearbandkeramik. *Quaternary International* 560–561, 228–239. https://doi.org/10.1016/j.quaint.2020.04.002

Hofmann, D., Frieman, C., Furholt, M., Burmeister, S. and Johannsen, N.N., 2024. *Negotiating Migrations: The Archaeology and Politics of Mobility*. London: Bloomsbury Academic. https://doi.org/10.5040/9781350427693

Horn, C., 2014. *Studien zu den europäischen Stabdolchen*, Universitätsforschungen zur prähistorischen Archäologie 246. Bonn: Habelt.

Horn, C. and Kristiansen, K., 2018. *Warfare in Bronze Age Society*. Cambridge: Cambridge University Press.

Jantzen, D., Brinker, U., Orschiedt, J., Heinemeier, J., Piek, J., Hauenstein, K., Krüger, J., Lidke, G., Lübke, H., Lorenz, S., Schult, M. and Terberger, T., 2011. A Bronze Age battlefield? Weapons and trauma in the Tollense Valley, northeastern Germany. *Antiquity* 85(328), 417–433.

Joffe, A.H., 2000. Egypt and Syro-Mesopotamia in the 4th Millennium: Implications of the New Chronology. *Current Anthropology* 41(1), 113–123.

Kaiser, E., 2019. *Das dritte Jahrtausend im osteuropäischen Steppenraum: Kulturhistorische Studien zu prähistorischer Subsistenzwirtschaft und Interaktion mit benachbarten Räumen*, Berlin Studies of the Ancient World 37. Berlin: Edition Topoi. http://dx.doi.org/10.17169/refubium-25398

Keeley, L.H., 1996. *War Before Civilization: The Myth of the Peaceful Savage.* 1st edition. New York: Oxford University Press Inc.

Knipper, C., Held, P., Fecher, M., Nicklisch, N., Meyer, C., Schreiber, H., Zich, B., Metzner-Nebelsick, C., Hubensack, V., Hansen, L., Nieveler, E. and Alt, K.W., 2015. Superior in Life – Superior in Death: Dietary Distinction of Central European Prehistoric and Medieval Elites. *Current Anthropology* 56(4), 579–589.

Krausse, D., Fernández-Götz, M., Hansen, L. and Kretschmer, I., 2016. *The Heuneburg and the Early Iron Age Princely Seats: First Towns North of the Alps*. Budapest: Archaeolingua.

Kristiansen, K. and Larsson, T.B., 2005. *The rise of Bronze Age society: travels, transmissions and transformations*. New York: Cambridge University Press.

Küßner, M. and Wechler, K.-P., 2019. Der Großbau der Aunjetitzer Kultur und das zugehörige Depot von Dermsdorf, Lkr. Sömmerda – ein Vorbericht. *In:* H. Meller, S. Friederich, M. Küßner, H. Stäuble and R. Risch, eds. *Siedlungsarchäologie des Endneolithikums und der frühen Bronzezeit [Late Neolithic and Early Bronze Age Settlement Archaeology]*, Tagungen des Landesmuseums für Vorgeschichte Halle 20.

Ling, J., Earle, T. and Kristiansen, K., 2018. Maritime Mode of Production: Raiding and Trading in Seafaring Chiefdoms. *Current Anthropology* 59(5), 488–524.

Lull, V., Rihuete Herrada, C. and Micó Pérez, R., 2011. El Argar and the beginning of class society in the Western Mediterranean. *In:* S. Hansen and J. Müller, eds. *Sozialarchäologische Perspektiven: Gesellschaftlicher Wandel 5000–1500 v. Chr. zwischen Atlantik und Kaukasus. Internationale Tagung 15.–18. Oktober 2007 in Kiel*, Archäologie in Eurasien 24. Mainz: Philipp von Zabern, 381–414.

Lund, J., Furholt, M. and Austvoll, K.I., 2022. Reassessing power in the archaeological discourse. How collective, cooperative and affective perspectives may impact our understanding of social relations and organization in prehistory. *Archaeological Dialogues* 29(1), 33–50.

Meller, H., Michel, K. and Schaik, C. van, 2024. *Die Evolution der Gewalt: Warum wir Frieden wollen, aber Kriege führen*. 1st edition. München: dtv.

Meyer, C., Knipper, C., Nicklisch, N., Münter, A., Kürbis, O., Dresely, V., Meller, H. and Alt, K.W., 2018. Early Neolithic executions indicated by clustered cranial trauma in the mass grave of Halberstadt. *Nature Communications* 9(1), 2472.

Meyer, C., Lohr, C., Gronenborn, D. and Alt, K.W., 2015. The massacre mass grave of Schöneck-Kilianstädten reveals new insights into collective violence in Early Neolithic Central Europe. *Proceedings of the National Academy of Sciences* 112(36), 11217–11222.

Miller, A., 1990. *For Your Own Good: Hidden Cruelty in Child-Rearing and the Roots of Violence*. 3rd edition. New York: Farrar, Straus and Giroux.

Muhl, A., Meller, H. and Heckenhahn, K., 2010. *Tatort Eulau: Ein 4500 Jahre altes Verbrechen wird aufgeklärt*. Stuttgart: Theiss, Konrad.

Müller, J., 2002. Endneolithisch-Frühbronzezeitliche Muster sozialen Wandels? Versuch einer Zusammenfassung. *In:* J. Müller, ed. *Vom Endneolithikum zur Frühbronzezeit: Muster sozialen Wandels? Tagung Bamberg 14.–16. Juni 2001*, Universitätsforschungen zur prähistorischen Archäologie 90. Bonn: Habelt, 291–293.

Müller, J., 2023. *Separation, hybridisation, and networks: Globular Amphora sedentary pastoralists ca. 3200–2700 BCE*, Scales of Transformation in Prehistoric and Archaic Societies 17. Leiden: Sidestone.

Neitzel, S. and Welzer, H., 2011. *Soldaten: Protokolle vom Kämpfen, Töten und Sterben*. 5thedition. Frankfurt am Main: Fischer.

Otterbein, K.F., 2004. *How War Began*. College Station: Texas A&M University Press. https://muse.jhu.edu/chapter/1863528/pdf ; last access 22nd September 2019

Pearson, M.P., Sheridan, A., Jay, M., Chamberlain, A. and Evans, J., 2019. *The Beaker People: Isotopes, Mobility and Diet in Prehistoric Britain*. Oxford: Oxbow Books.

Peter-Röcher, H., 2007. *Gewalt und Krieg im prähistorischen Europa. Beiträge zur Konfliktforschung auf der Grundlage archäologischer, anthropologischer und ethnologischer Quellen*, Universitätsforschungen zur prähistorischen Archäologie 142. Bonn: Habelt Verlag.

Pinker, S., 2012. *The Better Angels of Our Nature: Why Violence Has Declined*. New York: Penguin Books.

Pollock, S. and Bernbeck, R., 2000. And They Said, Let Us Make Gods in Our Image: Gendered Ideologies in Ancient Mesopotamia. *In:* A.E. Rautman, ed. *Reading the Body Representations and Remains in the Archaeological Record*. Philadelphia: University of Pennsylvania Press, 150–164. http://www.jstor.org/stable/j.ctv512z16

Rauer, C., 2020. Gewalt und Kult in der Bildsprache des Jungpaläolithikums. *In:* H. Meller, R. Risch, K.W. Alt, F. Bertemes and R. Micó, eds. *Rituelle Gewalt – Rituale der Gewalt/Ritual Violence – Rituals of Violence. 12. Mitteldeutscher Archäologentag von 10.–12. Oktober 2019 in Halle (Saale)*, Tagungen des Landesmuseums für Vorgeschichte Halle 22. Halle (Saale), Landesamt für Denkmalpflege und Archäologie Sachsen-Anhalt, 69–99.

Reid, J.N., 2023. Punishment for the Coercion of Labour during the Ur III Period. *International Review of Social History* 68(S31), 15–32.

Risch, R., 2015. Die Verherrlichung von Gewalt und Krieg. *In:* H. Meller and M. Schefzig, eds. *Krieg. Eine archäologische Spurensuche, Ausstellung im Landesmuseum für Vorgeschichte Halle (Saale) 6. November 2015 bis 22. Mai 2016*. Halle (Saale), Landesmuseum für Vorgeschichte, 135–138.

Schroeder, H., Margaryan, A., Szmyt, M. and Allentoft, M.E., 2019. Unraveling ancestry, kinship, and violence in a Late Neolithic mass grave. *Proceedings of the National Academy of Sciences* 116(22), 10705–10710.

Schulting, R., 2013. War Without Warriors? The Nature of Interpersonal Conflict before the Emergence of Formalized Warrior Elites. *In:* S. Ralph, ed. *The Archaeology of Violence: Interdisciplinary Approaches*. Albany, NY: SUNY Press, 19–36.

Schultrich, S., 2021. *Kriegerideal und Netzwerke: Die Doppeläxte West- und Mitteleuropas im Kontext der jung- bis endneolithischen Kulturentwicklung*. PhD thesis. Kiel: Christian-Albrechts-Universität zu Kiel).

Sigrist, C., 1967. *Regulierte Anarchie: Untersuchungen zum Fehlen und zur Entstehung politischer Herrschaft in segmentären Gesellschaften Afrikas*. Olten: Walter.

Stanish, C., 2017. *The Evolution of Human Co-operation: Ritual and Social Complexity in Stateless Societies*. Cambridge: Cambridge University Press.

Strahm, C., 2002. Tradition und Wandel der sozialen Strukturen vom 3. zum 2. vorchristlichen Jahrtausend. *In:* J. Müller, ed. *Vom Endneolithikum zur Frühbronzezeit: Muster sozialen Wandels? Tagung Bamberg 14–16. Juni 2001*. Universitätsforschungen zur prähistorischen Archäologie 90. Bonn: Habelt, 175–194.

Strahm, C. and Buchvaldek, M., 1991. *Die kontinentaleuropäischen Gruppen der Kultur mit Schnurkeramik*. Praha: Univerzita Karlova.

Teschler-Nicola, M., 2012. The *Early Neolithic site Asparn/Schletz (Lower Austria): anthropological evidence of interpersonal violence*. Oxford University Press. https://doi.org/10.1093/acprof:osobl/9780199573066.003.0006

Thurston, T.L., 2022. Reversals of fortune: Shared governance, "democracy," and reiterated problem-solving. *Frontiers in Political Science* 4. https://doi.org/10.3389/fpos.2022.870773

Thurston, T.L. and Fernández-Götz, M., eds., 2021. *Power from Below in Premodern Societies: The Dynamics of Political Complexity in the Archaeological Record*. Cambridge: Cambridge University Press. https://www.cambridge.org/core/books/power-from-below-in-premodern-societies/372249785256848CED0FC85AEA87546E ; last access 25th October 2022

Tomasello, M., 2009. *Why We Cooperate*. Cambridge, Mass: The MIT Press.

Vander Linden, M., 2006. *Le phénomène campaniforme dans l'Europe du 3ème millénaire avant notre ère: synthèse et nouvelles perspectives*. Oxford: Archaeopress.

Vander Linden, M., 2007. What linked the bell beakers in the third millennium europe? *Antiquity* 81, 343–352.

Weber, M., 1922. *Wirtschaft und Gesellschaft. Grundriss der verstehenden Soziologie*. Tübingen: Wunderkammer Verlag.

Wentink, K., 2020. *Stereotype. The role of grave sets in Corded Ware and Bell Beaker funerary practices*. Leiden: Sidestone. https://doi.org/10.59641/ba84e5a2

Włodarczak, P., Szczepanek, A. and Przybyła, M.M., 2021. Grave of the Globular Amphora culture from Koszyce in the chronological perspective. *Baltic-Pontic Studies* 25, 189–219.

Zalai-Gaál, I., Gál, E., Köhler, K., Osztás, A. and Szilágyi, K., 2012. Präliminarien zur Sozialarchäologie des lengyelzeitlichen Gräberfeldes von Alsónyék-Bátaszék, Südtransdanubien. *Praehistorische Zeitschrift* 87, 58–82. https://doi.org/10.1515/pz-2012-0004

Zeeb-Lanz, A., ed., 2016. *Ritualised Destruction in the Early Neolithic – The Exceptional Site of Herxheim (Palatinate, Germany)*. Speyer: Rheinland-Pfalz Generaldirektion kulturelles Erbe.

Zeeb-Lanz, A., ed., 2019. *Ritualised Destruction in the Early Neolithic – The Exceptional Site of Herxheim (Palatinate, Germany)*, Forschungen zur pfälzischen Archäologie 8. Speyer: GDKE, Direktion Landesarchäologie.

Zich, B., 2004. Die Fürstengräber von Leubingen und Helmsdorf. *In:* H. Meller and J. Lipták, eds. *Der geschmiedete Himmel: Die weite Welt im Herzen Europas vor 3600 Jahren. Begleitband zur Sonderausstellung Landesmuseum für Vorgeschichte Halle (Saale) vom 15. Oktober 2004 bis 24. April 2005*. Stuttgart: Theiss, 156–159.

Change in Early Bronze Age Hoard Inventories of Central Europe and Southern Scandinavia

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KEYWORDS: *Early Bronze Age, hoard inventories, Únětice culture, Southern Scandinavia*

Abstract

Metal artefacts of Únětice origin, together with local products in later phases, can be found in hoards from Central Europe to Southern Scandinavia from the Nordic Late Neolithic to the end of the Early Bronze Age (2200–1600 BCE). Chronological, technological and cultural aspects of deposition practices have been widely discussed and analysed. However, less attention has been paid to the selection and combination of inventory groups on the basis of the associated find types in the hoards. Here, the chronological changes in the deposition frequency of certain inventories are placed in the context of social and demographic developments, as well as changes in the number of traumata.

Zusammenfassung

Metallartefakte aunjetitzer Herkunft finden sich, in späteren Phasen auch zusammen mit lokalen Produktionen, in Horten von Mitteleuropa bis Südskandinavien und vom nordischen Spätneolithikum bis zum Ende der frühen Bronzezeit (2200–1600 v. Chr.). Chronologische, technologische und kulturelle Aspekte der Niederlegungspraktiken wurden vielfach diskutiert und analysiert. Weniger Aufmerksamkeit wurde jedoch der Auswahl und Kombination von Inventargruppen auf der Grundlage der zugehörigen Fundtypen in den Horten gewidmet. Hier werden daher die chronologischen Veränderungen in der Deponierungshäufigkeit bestimmter Inventare in den Kontext sozialer und demographischer Entwicklungen sowie der Veränderung der Anzahl von Traumata gestellt.

INTRODUCTION

Johannes Müller's research encompasses a range of topics related to the archaeology of Scandinavia, Poland, northern, and central Germany. These regions are clearly linked to one another by the distribution and inventories of hoards and deposits in the Nordic Late Neolithic and the local Early Bronze Ages (2200–1600 BCE). In this context, certain metal objects, which are generally assumed to have an 'Únětice provenance' (Willroth 2002, 103), and which were widely distributed during the 'classic' Únětice period, play a particularly important role. Additionally, in the Nordic Late Neolithic II, particularly after 1950 BCE, more local metal types began to emerge in southern Scandinavian deposits. From 1700/1600 BCE, with the advent of the Nordic Early Bronze Age (Period IA), these gradually gave rise to a standardised local style, initially retaining reference to the Central European inventory of forms (Filipp 2013, 552).

The analysis of hoard inventories often focuses on typological and chronological aspects (Lorenz 2010; 2013; Vandkilde 1996), metallurgical processes (Rassmann 2005; 2010) or cultural contexts (Filipp 2013; Meller 2013). Furthermore, studies on the social practice of depositing have also been conducted, often integrated into the aforementioned works (Vandkilde 2017; Visser 2021). In particular, the considerations regarding

the selection of the deposition site within the landscape (Fontijn 2002; Scholz 2012) merit mention here. The selection of objects to be deposited is situated within the field of tension between material culture and action theory. In the case of typo-chronological works, a change in the composition of hoards represents a fundamental starting point. However, the motivation behind the selection of types from different inventory groups (*e.g.* weapons, jewellery/costumes, tools, *etc.*) is rarely discussed for the time slices and regions covered here. For instance, Marieke Visser (2021, 91) observed that daggers and axes are more likely to be discovered as single finds, whereas jewellery and costume pieces are more commonly found in multiples in hoards. Nevertheless, it is also essential to consider the combination of find types and inventory groups in hoards in the context of the broader social and cultural evolution of the societies involved.

MATERIAL / DATA

The material was recorded as part of a 'Beethoven project' on the Únětice North led by Johannes Müller in Kiel and Janusz Czebreszuk in Poznań. The selection of hoards and subsequent classification of types was carried out by Annalena Pfeiffer. In general, single finds were not recorded as hoards or deposits. A total of 367 hoards were used for the purpose of chronological sorting and the examination of the composition of the inventories. With regard to the metal artefacts they contained, 150 were single-type hoards and 217 were multi-type hoards. The composition of the contents was analysed according to a division into five inventory groups:

1. Jewellery/Ornaments (*e.g.* rings, pins, necklaces, *etc.*)
2. Tools (awls, hooks, and chisels)
3. Weapons (daggers, halberds, *etc.*)
4. Axes (flat and flanged)
5. Miscellaneous (*e.g.* vessels, ingots, indeterminate objects)

Hoard inventories in which metal objects from the groups jewellery/ornaments, tools and/or other objects occur together, these are listed as mixed inventories. In addition, single-type hoards of these groups deposited in or with ceramic vessels were also categorised as mixed hoards. Similarly, inventories in which weapons and/or axes and artefacts from the other inventory groups occurred simultaneously were classified as mixed hoards with weapons. In this context, axes are primarily regarded as a subcategory of weapons in terms of their function, as Harald Meller (2013, 519) has already proposed that axes should be considered standard armament.

METHOD

The foundation for a new, comprehensive, relative chronological classification of the horizons is a seriation of the hoards (Raese, in prep.) and the find types they contain. This is based on the values of the first axis of a correspondence analysis in R (R Core Team 2022) with the package ca (Nenadić and Greenacre 2007). The inventories of 239 hoards, comprising 92 distinct types, were used for this purpose. The principal categories of types used to construct the chronology were primarily flanged axes and their variants, in addition to various types of rings. Furthermore, a new typology of ceramics for depositions in vessels was incorporated. Ultimately, five hoard phases or horizons were delineated, with dates ranging between 2150 and 1600 cal BCE, as determined by an age-depth model (Fig. 1).

In general, the newly proposed chronological sequence for the individual hoards and find types is comparable to previous findings (Krause 2003; Lorenz 2010; Rassmann 2005; Vandkilde 2017), even without the inclusion of metallurgical data. However, it consists of a division into five distinct phases. The distribution of the defining types largely follows the existing classifications into three or, in the case of Helle Vandkilde (2017, 120, fig. 66A), four horizons. The initial point in the seriation is in fact defined by the hoard find from Melz II (Lkr. Mecklenburgische Seenplatte, Mecklenburg-Vorpommern), and sets phase I parallel to hoard horizon II, as defined by Rüdiger Krause and Knut Rassmann. The greatest divergences can be observed in the division of the subsequent phases II–IV. Here, the hoard horizon III and the overlapping areas with horizons II and IV in Knut Rassmann's work and between II and III in Helle Vandkilde's work correspond to these three newly defined phases. The final phase V largely follows the established hoard horizon IV in terms of chronology and content.

Based on the new chronological classification and the assignment of the respective hoards to the above-mentioned inventory groups or the mixed hoards with or without weapons, an aoristic analysis

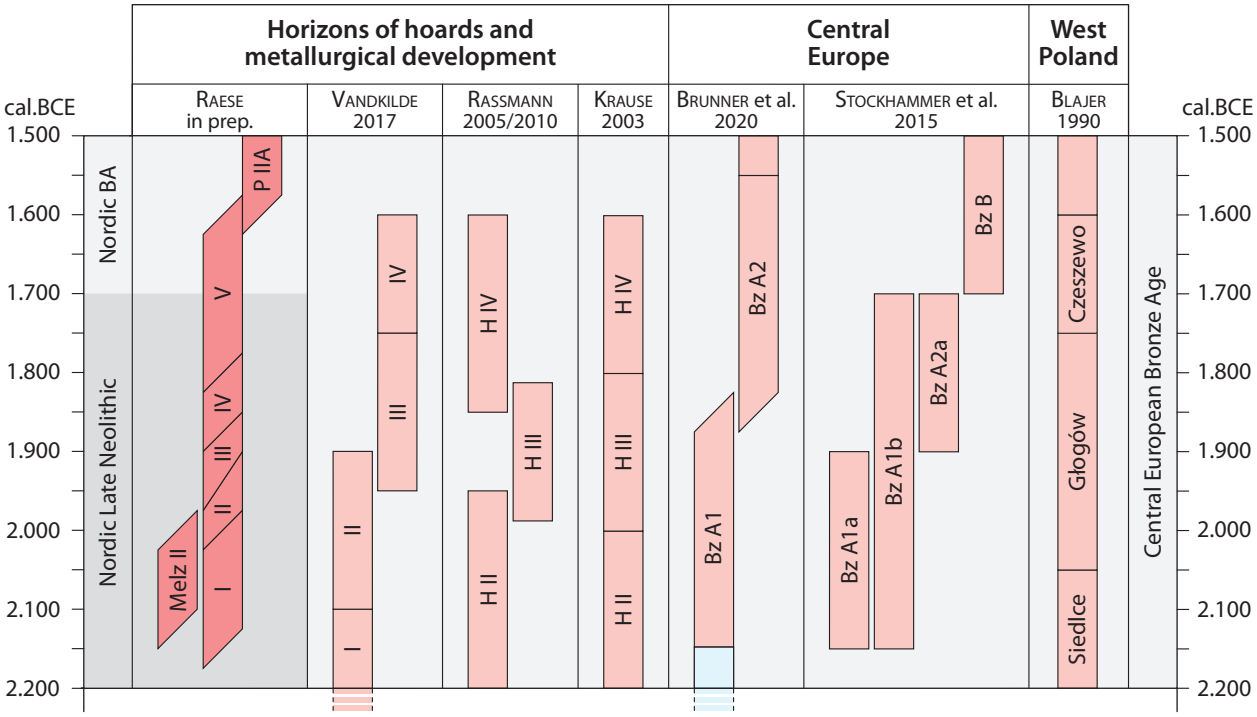

Fig. 1. Chronological table of a new (Raese in prep.) chronological horizon classification and existing definitions from the literature (Krause 2003; Rassmann 2005; 2010; Vandkilde 2017) for the Únětician and Nordic hoard inventories in comparison to two concepts for the general chronology of Central Europe (Brunner et al. 2020; Stockhammer et al. 2015) as well as the sequence of hoard phases for Western and Central Poland (Blajer 1990).

(see Crema 2024 for a bibliographic overview as well as advantages and disadvantages of this method) of the temporal distribution was undertaken. For this purpose, the probability densities over time for phases I-V were calculated for each hoard inventory category in R (R Core Team 2024) using the datplot package (Steinmann and Weissova 2021). Each hoard was weighted according to the number of years during which it was presumably deposited. In this process, the find could also be assigned to several phases if the material contained did not allow a more precise dating. The results for the individual phases were summarised and smoothed using a kernel density estimation (Fig. 2). It should be noted that the inventory groups for pure tool hoards were only represented in isolated cases and for miscellaneous hoards not at all. The former would have strongly distorted the picture and were therefore assigned to the mixed hoards.

DISCUSSION

In phase I, there is a consistent occurrence, at a low level, of mixed hoard inventories with and without weapons, as well as jewellery/ornament hoards. However, pure weapon and axe hoards are represented in significantly greater numbers. With phase II and especially in phase III, *i.e.* between 2000–1900 BCE, this picture changes pointedly. The hoards with only weapons decrease significantly and the number of hoards with only axes also decreases, while jewellery/ornament hoards and mixed hoard inventories without weapons are significantly more common. The number of hoards with weapons and other artefact types also increases during this period, but relatively less than for the weaponless hoards. This coincides with a decline in the number of skeletons with signs of violence from this period. Johannes Müller *et al.* (2024a, 10) note a significant drop in the frequency of trauma around 1900 BCE. A connection between fewer deposits of pure weapon hoards and a smaller number of injuries caused by these weapons seems obvious. A demographic connection is less clear, at least not for the entire study region. For an Únětice core area in the Circumharz region, a continuous population decline is reconstructed (Großmann *et al.* 2023, 13 fig. 4), but for north-eastern Germany, for example, a population peak can be determined around 2000 to 1800 BCE (Raese in prep.), and it is precisely here that numerous pure jewellery/ornament hoards (Fig. 3) can be found.

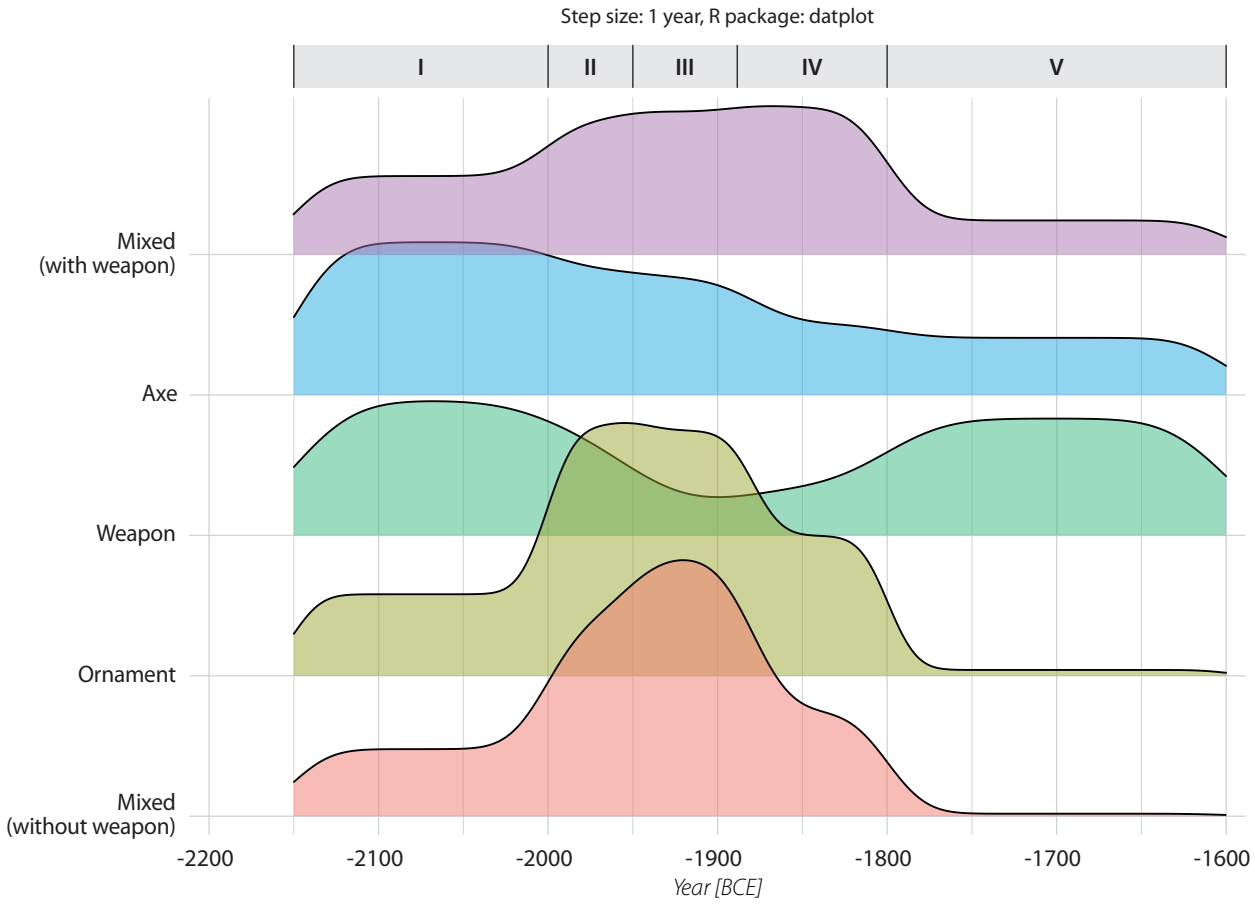

Fig. 2. Weighted aoristic sum for different hoard inventory categories based on a new chronological classification (Raese in prep.). The curves present a KDE of the calculated probability density weighted by the length of the assigned probable time period for every hoard included in the represented inventory categories.

The period of the higher frequency of ornament hoards and both types of mixed hoard inventories also coincide with the establishment of the 'classical' Únětice culture, the princely graves of Leubingen and Helmsdorf and a presumably pronounced social stratification (Vandkilde 2017, 119). The society in question places a greater emphasis on the role and status of the individual. In this context, weapon hoards can be interpreted as collective depositions and mixed hoards, in particular, as individual hoards.

Following the period after 1850 BCE, hoard phase IV, the picture changes once more. While the occurrence of mixed hoards with weapons persists at a high level, the frequency of pure ornaments hoards and mixed hoards that do not contain weapons declines markedly. During this period, there is a resurgence in the appearance of weapons hoards, particularly in southern Scandinavia. In phase V, hoards without weapons are hardly found at all and the pure weapon hoards are again as common as in phase I. The mixed hoards with weapons and the axe hoards are also less common in this phase, so that weapons again acquire a greater and possibly collective significance. A period of socio-cultural change, which had been constant up to this point, came to an end around 1700/1600 BCE. This was a time of consolidation in the Nordic area and the collapse of the Únětice culture in Central Europe (Müller *et al.* 2024b, 354 and 359). The late hoards are particularly prevalent in southern Scandinavia, suggesting that their frequency is primarily driven by social developments in this region. However, it should be noted that in Phase V and later, changes in the frequency of deposition of hoard inventory groups are also influenced by the more frequent addition of metal in graves, as opposed to hoards (Meller 2013, 519).

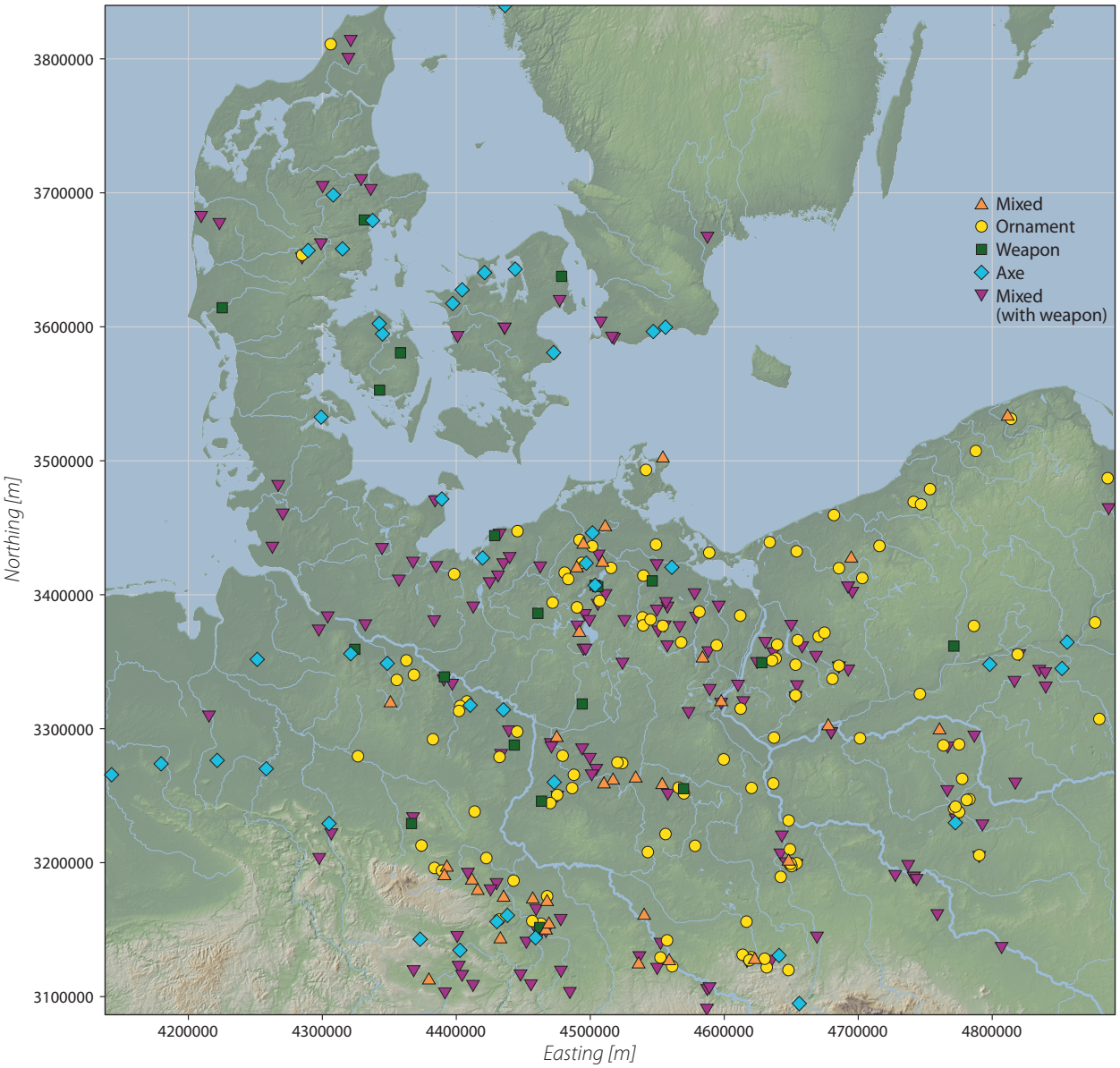

Fig. 3. The spatial distribution of the different hoard inventory categories reveals a notable disparity between the Southern Scandinavian region and the central European area. While the former exhibits a markedly lower prevalence of hoards comprising solely ornaments, the latter displays a greater incidence of such hoards. (Background: [ESA 2024]. CRS: ETRS89-LAEA Europe, EPSG:3035).

CONCLUSION

A comparison of the frequency of desposition of the individual hoard inventory groups reveals a distinct trajectory of development between 2200 and 1600 BCE. This can be related to demographic and social changes, particularly those observed in the Únětice culture. The decline in phases I to III and the subsequent resurgence in phases IV to V of hoards containing only weapons, which correlates with the frequency of evidence of trauma, is particularly visible. However, it should be noted that the change is not solely temporal in nature, but also spatial (Fig. 3). In the case of ornament hoards and mixed hoards without weapons, a division into three groups can be observed in a Central European comparison (cf. Scholz 2015, 135 fig. 1), with a significantly different distribution in southern Scandinavia. Despite the recurrence of a similar spectrum of types in analogous locations, the composition of the hoards appears to be subject to not only temporal changes but also local selection processes.

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REFERENCES

Blajer, W., 1990. *Skarby z wczesnej epoki brązu na ziemiach polskich*. Wrocław: Zakład Narodowy im. Ossolińskich.

Brunner, M., von Felten, J., Hinz, M. and Hafner, A., 2020. Central European Early Bronze Age chronology revisited: A Bayesian examination of large-scale radiocarbon dating. *PLoS ONE* 15(12), 1–24 https://doi.org/10.1371/journal.pone.0243719

Crema, E.R., 2024. A Bayesian alternative for aoristic analyses in archaeology. *Archaeometry 67(S1)*, 7–30. https://doi.org/10.1111/arcm.12984

ESA, 2024. *Copernicus Global Digital Elevation Model: Distributed by OpenTopography*. European Space Agency.

Filipp, J., 2013. Southern Scandinavia around 1600 BC: Signs of mobility, trade, and communication – the scimitars from Rørby (Denmark). *In: H. Meller et al. 2013*, 551–565.

Fontijn, D.R., 2002. *Sacrificial landscapes: Cultural biographies of persons, objects and 'natural' places in the Bronze Age of the Southern Netherlands, c. 2300–600 BC*. Leiden: University of Leiden.

Großmann, R., Weinelt, M. and Müller, J., 2023. Demographic dynamics between 5500 and 3500 cal BP (3550–1550 BCE) in selected study regions of Central Europe and the role of regional climate influences. *PLoS ONE* 18(10), 1–35. https://doi.org/10.1371/journal.pone.0291956

Krause, R., 2003. *Studien zur kupfer- und frühbronzezeitlichen Metallurgie zwischen Karpatenbecken und Ostsee*. Rahden/Westfalen: Verlag Marie Leidorf.

Lorenz, L., 2010. *Typologisch-chronologische Studien zu Deponierungen der nordwestlichen Aunjetitzer Kultur*, Universitätsforschungen zur prähistorischen Archäologie 188. Bonn: Habelt.

Lorenz, L., 2013. Entwurf einer zeitlichen Entwicklung der Deponierungssitte in den nordwestlichen Aunjetitzer Gruppen. *In*: J. Kneisel, H.J. Behnke and F. Schopper, eds. *Frühbronzezeit – Mittelbronzezeit: Neue Erkenntnisse zur Besiedlung zwischen Elbe und Warthe und angrenzender Regionen (2000–1400 v. Chr.). Symposium vom 24.–25. September 2011 in Welzow/Brandenburg*, Studien zur Archäologie in Ostmitteleuropa 10. Bonn: Habelt, 233–253.

Meller, H., 2013. Der Hortfund von Nebra im Spiegel frühbronzezeitlicher Deponierungssitten. *In: H. Meller et al. 2013*, 493–526.

Meller, H., Bertemes, F., Bork, H.-R. and Risch, R., eds. 2013. *1600 – Kultureller Umbruch im Schatten des Thera-Ausbruchs? 4. Mitteldeutscher Archäologentag vom 14.–16. Oktober 2011 in Halle (Saale)*, Tagungen des Landesmuseums für Vorgeschichte Halle 9. Halle (Saale): Landesamt für Denkmalpflege und Archäologie Sachsen-Anhalt.

Müller, J., Bilotti, G., Wilkes, F., Kruckenberg, C., Duffy, P.R., Hofmann, R. and Kneisel, J., 2024a. The monopolisation of violence: booms and busts of prehistoric violence linked to social inequalities. *Research Square: Preprint*. https://doi.org/10.21203/rs.3.rs-4904279/v1

Müller, J., Kirleis, W., Kneisel, J. and Rabbel, W., 2024b. Overarching Patterns of Ancient Transformation in Europe. *In*: J. Müller, W. Kirleis and N. Taylor, eds. *Perspectives on Socio-environmental Transformations in Ancient Europe*. Cham: Springer Nature, 343–367.

Nenadić, O. and Greenacre, M.J., 2007. Correspondence Analysis in R, with two- and three-dimensional graphics: The ca package. *Journal of Statistical Software* 20(3), 1–13.

R Core Team, 2022. R: *A Language and Environment for Statistical Computing*: Version 4.2.2. Wien: R Foundation for Statistical Computing.

R Core Team, 2024. R: *A Language and Environment for Statistical Computing*: Version 4.4.2. Wien: R Foundation for Statistical Computing.

Raese, H., in preparation. *Die spätneolithische und frühbronzezeitliche Besiedlung und Landschaftsnutzung zwischen Ostholstein und Kujawien – ca. 2500–1500 v. Chr.: „predictive mapping" und andere Modelle*. PhD thesis. Kiel: Christian-Albrechts-Universität zu Kiel. doi:10.5281/zenodo.14256432 ; last access 4th December 2024

Rassmann, K., 2005. Zur Chronologie der Hortfunde der Klassischen Aunjetitzer Kultur: Eine Auswertung von Metallanalysen aus dem Forschungsvorhaben "Frühe Metallurgie im zentralen Mitteleuropa". *In:* B. Horejs, R. Jung, E. Kaiser and B. Teržan, eds. *Interpretationsraum Bronzezeit: Bernhard Hänsel von seinen Schülern gewidmet*, Universitätsforschungen zur prähistorischen Archäologie 121. Bonn: Habelt, 463–480.

Rassmann, K., 2010. Die frühbronzezeitlichen Stabdolche Ostmitteleuropas: Anmerkungen zu Chronologie, Typologie, Technik und Archäometallurgie. *In:* H. Meller and F. Bertemes, eds. *Der Griff nach den Sternen: Wie Europas Eliten zu Macht und Reichtum kamen internationales Symposium in Halle (Saale) 16.–21. Februar 2005*, Tagungen des Landesmuseums für Vorgeschichte Halle 5. Halle (Saale): Landesamt für Denkmalpflege und Archäologie in Sachsen-Anhalt, Landesmuseum für Vorgeschichte.

Scholz, H., 2012. Hoard find places in the context of climatic and environmental changes. *In:* J. Kneisel, W. Kirleis, M. Dal Corso, N. Taylor and V. Tiedtke, eds. *Collapse or continuity? Environment and development of Bronze Age human landscapes*, Universitätsforschungen zur prähistorischen Archäologie 205. Bonn: Habelt, 153–167.

Scholz, H., 2015. The So-called Únětice Hoards of the North: A Precipitation of the Movement of Things, Ideas or People? *In*: P. Suchowska-Ducke, S.S. Reiter and H. Vandkilde, eds. *Forging identities: The mobility of culture in Bronze Age Europe report from a Marie Curie project 2009–2012 with concluding conference at Aarhus University, Moesgaard 2012*, BAR international series 2771–2772. Oxford: British Archaeological Reports, 133–142.

Steinmann, L. and Weissova, B., 2021. datplot: A New R Package for the Visualization of Date Ranges in Archaeology. *Advances in Archaeological Practice* 9(4), 288–298.

Stockhammer, P., Massy, K., Knipper, C., Friedrich, R., Kromer, B., Lindauer, S., Radosavljević, J., Wittenborn, F. and Krause, J., 2015. Rewriting the Central European Early Bronze Age Chronology: Evidence from Large-Scale Radiocarbon Dating. *PLoS ONE* 10(10), 1–32.

Vandkilde, H., 1996. *From stone to bronze: The metalwork of the late neolithic and earliest Bronze Age in Denmark*, Jysk Arkaeologisk Selskabs skrifter 32. Århus: Jutland Archaeological Society Moesgård.

Vandkilde, H., 2017. *The Metal Hoard from Pile in Scania, Sweden: Place, Things, Time, Metals, and Worlds Around 2000 BCE*. Aarhus: Aarhus University Press.

Visser, M., 2021. *A completely normal practice: The emergence of selective metalwork deposition in Denmark, north-west Germany, and the Netherlands between 2350–1500 BC*. Leiden: Sidestone.

Willroth, K.-H., 2002. Die Nordische Bronzezeit: Anmerkungen zu ihrer Herausbildung. *Bericht der Römisch-Germanischen Kommission* 83, 99–122.

Chiefs and Rebels?
Alternative Concepts for Bronze Age Societies in Northern Germany

Stefanie Schaefer-Di Maida

KEYWORDS: *Bronze Age politics, warrior, identities, power, barrows, political theory*

Abstract

In the field of Nordic Bronze Age studies, discourses tend to favour approaches that associate this era of metal production with a strictly hierarchical and authoritarian society. In this context, graves with excessive furnishings are highlighted, which serves to reinforce corresponding but outdated concepts. However, on what basis can this be reconstructed for Northern Germany, which apparently forms the rural and less densely populated periphery of the Nordic Circle, and are there perhaps alternative concepts that could be conceived here? In contrast to a few settlement sites, there are several burial mounds of the Older Bronze Age (1750–1200 BCE) and a comparatively large number of urn graves of the Younger Bronze Age (1200–500 BCE). In research, the period of barrow construction is frequently characterised by the organisation of social structures into chiefdoms, which were associated with specific power dynamics. The performance of these power structures is supposed to be reflected in the construction of warrior graves. But, it is questionable whether power was truly as centralised as is often assumed. It is unclear who made decisions and whether the barrow was intended as an "award" for an individual or for the community as a whole. With the shift from inhumation to cremation, there was a considerable decline in mound construction, with only a few single large burial mounds still being built. While some theories persist in assessing chiefs as less frequent, but more powerful, also drawing on rather one-dimensional definitions of power, this paper takes a multidimensional perspective based on the reconstruction of burial change, depicting the related sharp processes of change in social organisation (*e.g.* household, cooperation, resource allocation and access, *etc.*). This contribution thus sheds a different light on the discussion about the organisation of Bronze Age societies and refers to concrete find reconstructions from Northern Germany.

Zusammenfassung

Im Bereich der nordischen Bronzezeitforschung tendieren die Diskurse zu Ansätzen, die diese Epoche der Metallproduktion mit einer streng hierarchischen und autoritären Gesellschaft in Verbindung bringen. In diesem Zusammenhang werden Gräber mit übermäßiger Ausstattung hervorgehoben, was entsprechende, aber überholte Vorstellungen verfestigt. Doch auf welcher Grundlage lässt sich dies für Norddeutschland, das offenbar die weniger dicht besiedelte Peripherie des Nordischen Kreises bildet, rekonstruieren, und gibt es vielleicht alternative Konzepte, die hier denkbar wären? Den wenigen Siedlungsplätzen stehen mehrere Grabhügel der Älteren Bronzezeit (1750-1200 v. Chr.) und eine vergleichsweise große Zahl von Urnengräbern der Jüngeren Bronzezeit (1200-500 v. Chr.) gegenüber. Die Zeit des Grabhügelbaus wird in der Forschung häufig durch die Organisation sozialer Strukturen in Häuptlingstümern gekennzeichnet, die mit einer spezifischen Machtdynamik verbunden waren. Die Ausübung dieser Machtstrukturen spiegele sich in der Anlage von Kriegergräbern wider. Es ist jedoch fraglich, ob die Macht wirklich so zentralisiert war, wie oft angenommen wird. Es ist unklar, wer die Entscheidungen traf und ob der Grabhügel als „Auszeichnung" für eine Einzelperson oder für die Gemeinschaft als Ganzes gedacht war. Mit dem Übergang von der Körper- zur Brandbestattung ging der Bau von Grabhügeln erheblich zurück, und es wurden nur noch wenige einzelne große Grabhügel errichtet. Während einige Theorien die Häuptlinge als weniger, aber einflussreicher einstufen und sich

dabei auf eher eindimensionale Definitionen von Macht stützen, wird in diesem Beitrag eine mehrdimensionale Perspektive eingenommen, die auf der Rekonstruktion des Wandels im Bestattungswesen beruht und die damit zusammenhängenden starken Veränderungsprozesse in der sozialen Organisation (z. B. Haushalt, Zusammenarbeit, Ressourcenzuteilung und -zugang usw.) aufzeigt. Der Beitrag wirft damit ein anderes Licht auf die Diskussion um die Organisation bronzezeitlicher Gesellschaften und bezieht sich auf konkrete Fundrekonstruktionen aus Norddeutschland.

INTRODUCTION

The introduction and circulation of bronze raw materials and finished bronze objects are frequently regarded as a catalyst for social differentiation. This process is often seen to have occurred in conjunction with the expansion of networks, which promoted inequality, the market, the pursuit of production and the rise of chiefs and warriors (Kristiansen and Larsson 2005; Kristiansen and Earle 2015).

Nevertheless, the author queries whether any concept of resource economy, productivity, or social differentiation existed in rural or peripheral regions, which are defined as being situated outside of densely populated areas. Furthermore, the very concept of inequality may be a Western-oriented and Eurocentric perspective that is not applicable to the reconstruction of prehistoric societies.

A further issue is that identities, such as those of 'chiefs' or 'warriors', are often assumed to be fixed and unchanging, when in fact they may have been flexible and relational, as evidenced by the field of ethnology. As outlined by David Graeber and David Wengrow (Graeber and Wengrow 2021), Claude Lévi-Strauss observed in 1944 that the role of chiefs in the Nambikwara society was subject to fluctuations in accordance with the seasonal variations in social life. They engaged in part-time farming and part-time foraging, inhabiting a notoriously inhospitable stretch of savannah in northwest Mato Grosso in Brazil. During the nomadic adventures of the dry season, they assumed the role of heroic leaders, issuing commands, resolving crises, and behaving in a manner that would be considered unacceptably authoritarian at other times. During the wet season, when resources were more abundant, these leaders relied on their reputations to attract followers and encourage them to settle in villages. They employed gentle persuasion and demonstrated through their own actions how to construct houses and tend gardens. In this way, they provided care for the sick and needy, facilitated the resolution of disputes, and never imposed their will on others (Graeber and Wengrow 2021, 98–101).

An additional example can be found in the work of David Graeber and David Wengrow (2021), who present the findings of Robert Lowie's observations. In the late summer and early autumn months, small and highly mobile bands of Cheyenne and Lakota would congregate in large settlements to make logistical preparations for the buffalo hunt. At this most sensitive time of year, a police force was appointed, which exercised full coercive powers, including the right to imprison, whip or fine an offender who endangered the proceedings. However, as Lowie observed, this "unequivocal authoritarianism" was limited in scope and time, operating only during specific seasons and for a defined period. Once the hunting season and the collective Sun Dance rituals that followed had concluded, the aforementioned authoritarianism gave way to what he termed 'anarchic' forms of organisation, whereby society split once again into small, mobile bands (*ibid.*, 107–108).

The two examples illustrate that the role of a chief may evolve in response to changing social needs, and that political structures may undergo significant transformation within a relatively short timeframe, from authoritarian to anarchic structures.[1] These examples are not exhaustive; numerous others can be found in the anthropological literature (see *e.g.* Stanish 2017). It would be beneficial to apply this multidimensional perspective to the field of prehistory. It is crucial to acknowledge the flexible nature of chiefs, a concept that is often overlooked in the study of Bronze Age politics. Political roles are frequently depicted as static, yet the dynamic nature of chiefs merits closer examination. Such fixed categories in Bronze Age research frequently coincide with one-dimensional definitions of terms. These descriptions portray power structures as masculine, dominant, and violent (Weber 1980, 28), whereas power can manifest as a collective and consensual phenomenon (Arendt 1970; Foucault 1994, 302; Schaefer-Di Maida *et al.* 2024).

The latter is particularly pertinent to rural areas and regions with low residential density that

1 Furthermore, this process is analogous to the stages involved in the preparation of a joint funding proposal.

Table 1. The problem of categories and power-definitions.

Out-dated Definition of power (*e.g.* Max Weber)	**Multidimensional approaches (*e.g.* Hannah Arendt; MichelFoucault)**
Institutionalised coercive rule	Collective and consensus-based nature
Threat of violence	Separation of power and violence
Male and patriarchic	Power as relationship of interacting forces in all social spheres
Static	Flexible

are eligible for collective decision-making processes. However, in cases where a chief was in power, the question arises as to why such a person would have been oppressive.

Another stereotype of the Bronze Age is that of so-called "kings" — as it has been already criticised by Martin Bartelheim (2022, 22) — and "princes" (*e.g.* as it has been applied for example to the Únětice culture, Meller 2019) or the warrior, who is considered to be 'very' male and often seen as a central character arising from the Neolithic period, first with battle axes (see also Helle Vandkilde, Martin Furholt and Harry Fokkens in this volume), later with daggers and 'finally' with the sword in the Bronze Age (Iversen 2017, 363–364; Horn 2023). Notwithstanding the extremely unreflected and anachronistic use of such stereotypical terms, however, such a described diachronic sequence would imply that politics reflect an evolutionary process, which is implausible given the volatility of political landscapes. Ethnological, historical, and contemporary political events demonstrate that political dynamics can shift significantly within a year. It is therefore not possible to construct an evolutionary narrative, as this would imply that our current political system represents the endpoint of a process of evolution, which is clearly not the case.[2] However, politics must therefore be regarded as a highly dynamic field. In the following section, this contribution will examine the rural, and arguably peripheral, region in Southern Scandinavia, situated at the periphery of the Nordic Circle. In doing so, it will address the following questions: What can be inferred about the nature of politics in this region? What was the nature of the political process? What forms of political organisation might be postulated? It would be beneficial to ascertain how the observed change in burial rites might be integrated into the existing political framework.

The geographical area under consideration in this paper is the German federal state of Schleswig-Holstein, situated in the northern part of the country. The present study is primarily concerned with the Bronze Age, which is dated to have occurred between 1750 and 500 BCE in this region. The construction of burial mounds continued until 1300 BCE. The shift from inhumation to cremation led to a precipitous decline in the construction of burial mounds, with cremation instead buried in urn graves (Schaefer-Di Maida 2023).

With regard to the Bronze Age, it is known that there were only a few settlements in Schleswig-Holstein, and that these were always single farmsteads. A comparison with Jutland reveals a significant contrast in settlement dynamics (see Fig. 1–2), which is attributable to a combination of factors, including research (*ibid.*, 272–275).

The following section presents examples from the study area, focusing on the transformations of political processes evident in settlements, graves, and material culture.

1750–1300 BCE: GRAVE MOUNDS AND HOUSEHOLDS

Only a limited number of house floor plans are known to originate from the work region. The aforementioned examples illustrate the initial stages of the construction of three-aisled houses dating to approximately 1600/1500 BCE. This development can be situated within the broader regional context of the byre dwelling in Southern Scandinavia and Northern Germany (Bech and Rasmussen 2018, 33–36). Between 1750 and 1300 BCE, there is evidence to suggest that house sizes in Schleswig-Holstein increased from approximately 100 to 250 square metres (Kneisel *et al.* 2019, 1615 fig. 6; Schaefer-Di Maida 2023, 279). This increase is frequently linked to an expansion in the size of households or shifts in the composition of household communities.

2 It is somewhat remarkable that a system characterised by capitalist principles and the use of bureaucracy as an instrument of control has endured for such a considerable length of time.

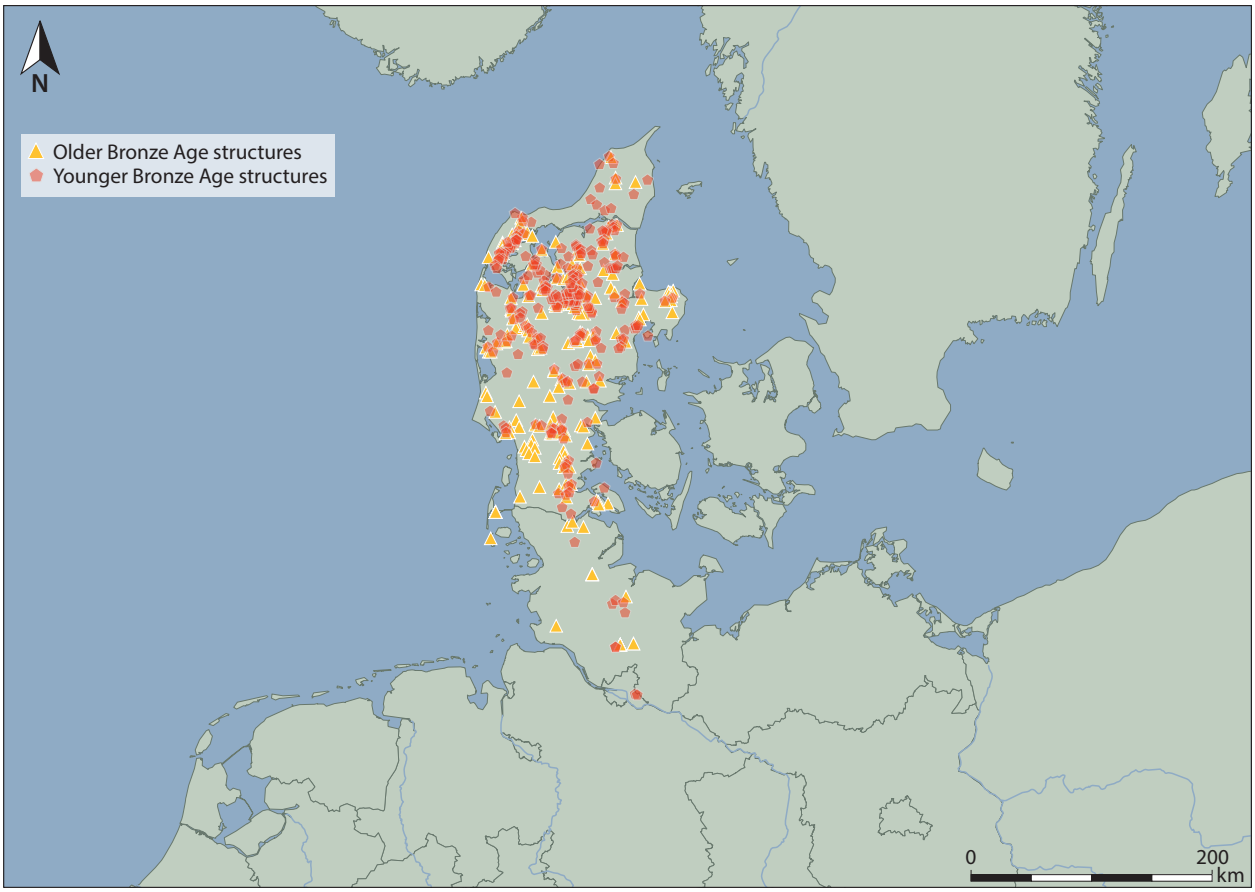

Fig. 1. A comparative analysis of the Bronze Age settlement records of Jutland and Schleswig-Holstein (Map: Karin Winter).

A house from Period II (1500–1300 BCE) had a floor area of approximately 150 m². The number of individuals per household is estimated to be between 15 and 30, as proposed by Marie Louise Stig Sørensen (2010, 127 table 5.2; Fokkens 2009, 97). The aforementioned calculation indicates a decrease in the number of inhabitants to a range of 10–20 individuals. In light of experiments on barrow construction, it is frequently assumed that a single household group was responsible for the erection of a barrow (Kristiansen 2018, 117). This hypothesis is corroborated by the findings of the Handewitt grave mound, which was constructed on the remains of a house. Nevertheless, only three other sites in Denmark have been identified that exhibit this phenomenon (Svanberg 2005, 79). The individual interred in such a superimposed barrow is frequently interpreted as the head of the household, who held the greatest authority (Kristiansen 2006, 177). This power is frequently described in economic terms, whereby the household is regarded as an economic entity (Sahlins 1963, 291; Widmann 2007, 5–6). This perspective is shaped by the prevailing Western and capitalist understanding. Conversely, it is equally plausible that the concept of productivity did not exist at all. The burial mound can thus also be regarded as a monument of the collective and the individual as a representative of that group. However, it should be noted that the individual has merely been granted social power by the collective. This may take the form of a rhetorician, a symbolic figure, or a coordinator of specialised labour (Stanish 2017, 100). It is possible that this role was highly flexible and transferable (*ibid.*, 181–183), as well as contingent on the collective's perception (*ibid.*, 71–73). Furthermore, the distribution of roles for mound-building activities is frequently elucidated through the lens of hierarchical and categorical structures (Kristiansen 2018, 114–115). For larger cooperative activities, it is reasonable to assume that a decision-making function existed, although this may also have been confined to specific events such as the construction of a barrow or a house, as evidenced by ethnological examples (Stanish 2017, 97–99).

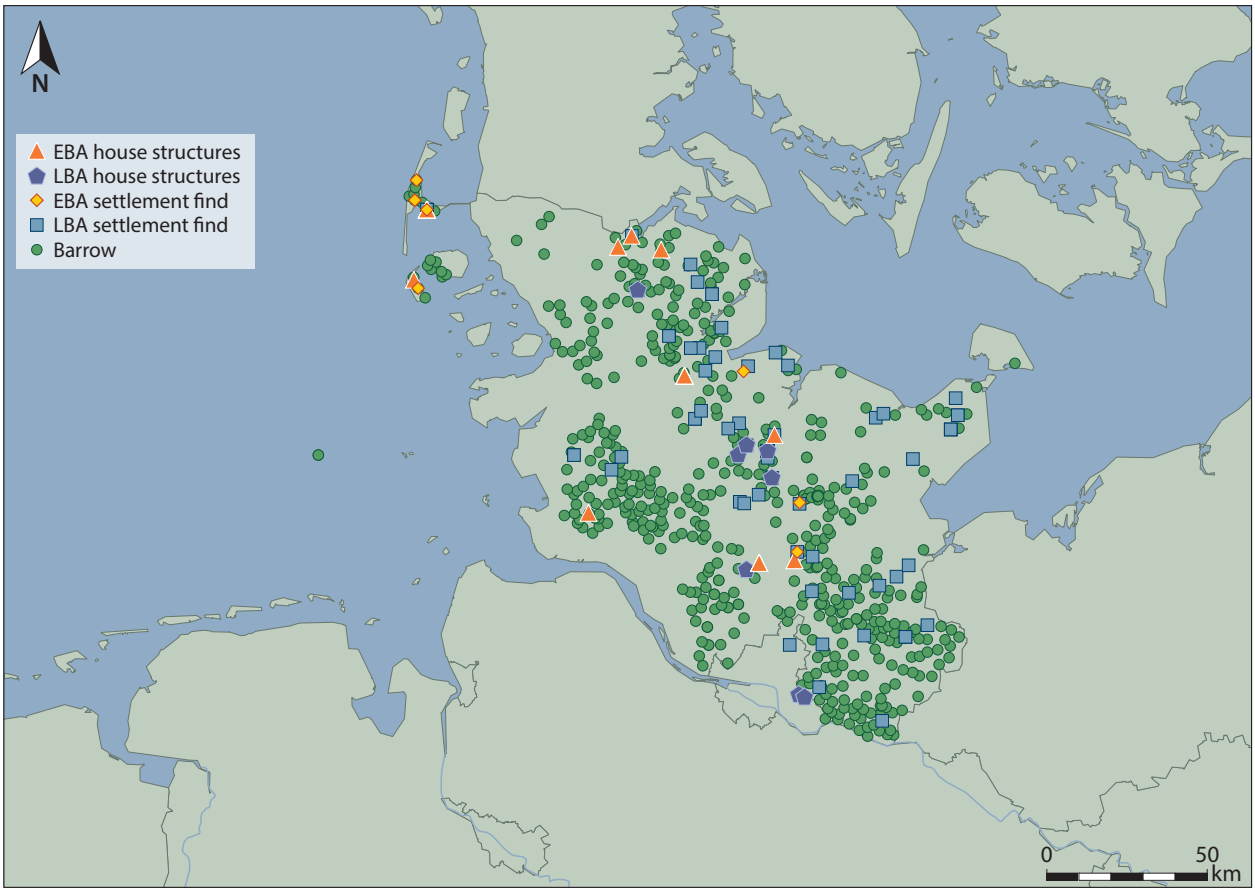

Fig. 2. A map of Schleswig-Holstein, indicating the distribution of Bronze Age settlements, settlement finds and burial mounds (Map: Karin Winter).

1750–1300 BCE: WHERE ARE THE SWORDS?

A search for Bronze Age warriors in Schleswig-Holstein reveals a somewhat unclear picture. Firstly, the majority of the graves in barrows are furnished with dress components, while the objects usually grouped among weapons do not always contain a sword. However, they can be divided into spearheads, arrowheads, bronze swords, sword accessories, bronze daggers and flint daggers. Daggers, however, have now often been excluded as typical weapons. They occur in all graves (both male and female connotations, Felding 2022, 101–102, 112, 130) and could be associated with butchery activities (Caricola *et al.* 2022). They must therefore be seen more as a multi-tool (weapon, household tool and/or status symbol without any gender-binding). Upon mapping solely the barrows with swords, it becomes evident that they occur in a highly sporadic manner and are concentrated primarily in the western region of the study area. Furthermore, it is evident that these sword-graves do not exhibit a uniform grave kit pattern, but rather contain a diverse array of dress components, or in some cases, no additional items. A similar phenomenon was also observed in the Danish region that borders this area (Felding 2022, 107–108). Especially the graves with one sword only and no other objects, in particular, often makes such "warrior-graves" look poorly equipped. Despite this obviousness, the image of the 'poor warrior' has not yet found its way into research, not least because the romanticised image of the handsome warrior simply sells well.

In contrast, a considerable number of grave mounds lack weapons but are nevertheless of considerable interest, at least when viewed through the lens of modern understanding. These graves often contain bronze, gold, textiles, and other objects, making them far richer than those that do contain weapons. Such graves can actually be found in all parts of Schleswig-Holstein. Examples include the following: primary grave

Fahrenkrug LA 89 of Period I with 28 objects[3] (Aner *et al.* 2011, catalogue-no. 9855), the primary grave of Flintbek LA 1 of Period II with about 15 objects[4] (Aner *et al.* 2005, 36–38, catalogue-no. 9593), primary grave of Grevenkrug LA 2 of Period III with 65 objects[5] (*ibid.*, 91–94, catalogue-no. 9624), the large barrow 'Heesbarg' in Schalkholz with richly equipped graves of Period III (Aner and Kersten 1991, 76–77, catalogue-no. 9235), the double grave in a barrow in Handewitt LA 10 of Period III (Aner and Kersten 1978, catalogue-no. 2227) — just to mention a very few.

It is interesting to note that there is no category for such graves that are rich in grave goods and have a complex grave construction, but devoid of weapons. The practice of burying women in such opulent graves has yet to be fully incorporated into the existing narratives. However, we can no longer deny that women were associated with such richly appointed burials (see also Harald Meller in this volume), even if this means that they are dwarfing those of warriors.

The mentioned grave-distribution demonstrates that the so-called "warrior elite" is not accurately reflected in this region. Instead, one can identify local groups with differently equipped individuals who, if one is to use the term "power," may have had just as much social power as those with oppressive power. It is also possible that the carrying of weapons in this region may have developed simply as a rudimentary habit, even if it may no longer have had a combat function. The frequently asserted "masculinity" of these graves (*e.g.* Horn *et al.* 2018; Meller 2019; Risch *et al.* 2021; Horn 2023, 67) must also be subjected to rigorous scrutiny, as osteological analyses are lacking (this phenomenon also occurs outside of Schleswig-Holstein, see Kneisel *et al.* 2024; Felding 2022 32–36; Kneisel and Schaefer-Di Maida in press).

1300 BCE: BURIAL RITE CHANGE: FROM INHUMATION TO CREMATION

The 13th century BCE marks a period of significant change in the archaeological record. A significant shift occurred in burial practices, with the transition from inhumation to cremation becoming prevalent (Fig. 3). By 1300 BCE, this change was observed across Europe, with the majority of individuals who had passed away being cremated. This transformation was observed across all societies, irrespective of community size, worldview or political orientation. The earliest known cremation burial in Schleswig-Holstein is dated to Period I–II (1605–1425 cal BC) and was discovered in an archaeological site in Albersdorf (Aner and Kersten 1991, 5–6; Schaefer-Di Maida 2023, 231–232). The individual in question was not accompanied by any grave goods. The placement in close proximity to the west coast may indicate that the cremation burial custom was influenced by sea routes (*ibid.*, 231). The individual's foreign origin is also supported by strontium isotope analysis, the publication of which is currently in progress by the author. In the remainder of Schleswig-Holstein, the actual transition from inhumation to cremation is only evident from Period II to III, which corresponds to approximately 1300 BCE. The earliest cremations were interred in the same manner as inhumations, within tree coffins beneath burial mounds. Concurrently, the construction of burial mounds underwent a precipitous decline. Subsequently, only secondary burials were conducted within existing barrows, with no further construction of new barrows. Furthermore, the practice of urn burial became increasingly prevalent, emerging around 1200 BCE, as shown in the example of the

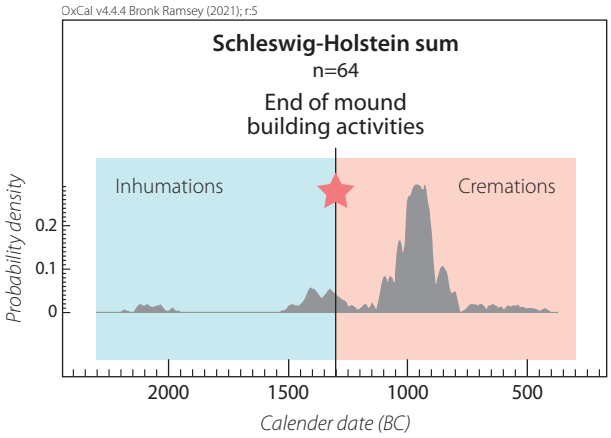

Fig. 3. Sum calibration of graves in Schleswig-Holstein, marking the inhumations on the left and the cremations on the right, as an example for the transition from inhumation to cremation in the work area of the study.

3 Two spiral rings, necklace with 19 amber beads, two crescent-shaped bronze pendants, rolled-head pin, two arm spirals, woollen fabric.

4 Neck collar, wheel pin, two awls, two finger spiral rings, small ring, two forearm spirals, two small twisted rings, small wire rings, arm ring, massive ring, flint flake.

5 Two gold spiral rings, necklace of 48 glass and 12 amber beads, brooch, bronze 'buckel', woollen fabric.

cemetery of Mang de Bargen (Schaefer-Di Maida 2023). The introduction of urn burial led to a standardisation of grave goods and an increase in the number of individuals receiving a burial. Nevertheless, it remains unclear why the construction of burial mounds ceased. This would indicate that the role of the individual, who had previously been buried in a barrow, was either lost or transformed. Such a significant shift in funerary practices would have had ramifications for political structures and processes. Furthermore, it is unclear whether cremation was practised at all, or only in certain circumstances. Was this a personal decision, and could opponents and strugglers still be buried as inhumations? It is therefore pertinent to enquire as to whether the decision as to who was buried and in what manner was at the discretion of a particular individual or entity.

A grave mound at Grevenkrug provides an example of the occurrence of both body treatments, inhumation and cremation, in the same feature (Aner *et al.* 2005, 91–92). Burial A, which is also the primary burial of the barrow, contained an inhumation and cremated bones in a tree coffin that had been placed on a stone pavement and covered with a stone packing. The cremated individual's bones indicate an age between eight and ten years, thus indicating that the deceased was a child. It was not possible to assign a sex to the individual due to its young age. Furthermore, strontium isotope analysis indicated that this child had a non-local origin (Schaefer-Di Maida *et al.* in prep.). The individual who had not undergone cremation was determined to be between 12 and 25 years of age. Furthermore, it was not possible to assign a sex. The grave yielded a plethora of artefacts, including two gold spiral rings, a necklace comprising 48 glass and 12 amber beads, a fibula, a bronze hump, and wool remnants. The tomb was covered with a mound measuring 6.6 metres in diameter. The absolute date enables the grave to be dated from the end of period II to the middle of period III (approximately 1350–1200 BCE, Schaefer-Di Maida 2023, 227). This grave provides evidence of the parallel use and common burial of both body treatments. This finding is not isolated; another burial mound from Harrislee has been identified, which also contained both a body burial and a cremation burial (Aner and Kersten 1978, catalogue-no. 2246). In light of these particular instances, it appears that both forms of burial are compatible with one another. It may be presumed that the choice of one or the other is contingent upon a number of factors, including the individual's social, spiritual, and cultural affiliations, as well as their worldview.

1300 BCE: EMBEDDING THE BURIAL RITE CHANGE

In addition to the alteration in burial rites, the archaeological evidence suggests the occurrence of other changes that may have had political significance during this period. In particular, the end of barrow construction signifies the termination of former collaborative patterns and groups. The simultaneous establishment of smaller houses (see above) (Schaefer-Di Maida 2023, 279; Kneisel 2019, 1615 fig. 6; Donat 2018, 184–85) may indicate a reduction in the size of house communities, which could be a consequence of the decline in activities associated with larger groups, such as house and mound building.

With the end of mound construction, urns were now interred in flat graves. It is notable that the total number of graves increased, indicating that a greater number of individuals were interred. This is frequently attributed to an increase in egalitarianism; however, an alternative hypothesis is that, in lieu of collective barrow construction, the individual assumed greater significance through the act of interment (Schaefer-Di Maida 2023, 242).

The majority of grave goods consisted of costume items and toilet utensils. It can be observed that weapons are no longer included in the grave kits. The range of urns demonstrates a predominance of simple and analogous forms, whereas the diversity of shapes exhibits a discernible expansion from Period II to III (Schaefer-Di Maida 2024). Some objects, such as razors, now display new symbolism that did not exist prior to the burial change, including the sun barque and animal symbolism, which suggests new influences, which might have changed worldviews and ideologies (Schaefer-Di Maida and Kneisel 2023).

Concurrently, there is evidence of a precipitous decline in the number of depositions placed during this period. This decline is frequently attributed to network disruptions or material deficiencies. However, it is also conceivable that the significance of these objects underwent a transformation or was diminished over time (Brück and Fontijn 2013; Schaefer-Di Maida and Kneisel 2023).

1400–500: COOKING STONE PITS: MEETING PLACES?

In addition to the aforementioned processes of transformation, new activities may also offer insights into the political decision-making processes. Indeed, the emergence of cooking stone pits coincides with alterations in burial practices and the formation of new cooperation patterns. These are pits containing ash, charcoal and heated stones. The arrangement of these pits can vary, occurring in circles, rows, or disordered formations (Schmidt and Forler 2003; Schmidt 2014; Kruse and Matthes 2017; 2019; Schaefer-Di Maida 2022). They can also be found on a small scale or cover vast areas. Such areas demonstrate prolonged periods of utilisation, thereby indicating the potential for their function as gathering places. For instance, the Egelund site, located between two settlements, has been in use for 1,000 years, concurrent with the settlement activities (Kruse and Matthes 2017, 25–30). The function of such pits is a topic of considerable debate among scholars. The majority of interpretations and comparisons to ethnographic examples indicate that these pits were used for food preparation (Schmidt and Forler 2003, 38; Schmidt 2014, 145, 154, 38; Honeck 2009, 32–35). In this regard, ethnological comparisons and experiments indicate that a single cooking stone pit could be used for the preparation of food for approximately ten individuals (Kristensen 2008, 40). In southern Scandinavia, such locations are found between disparate settlements. Accordingly, Pernille Kruse and Lilian Matthes posit that members of separate households and/or settlement communities gathered at such locations (Kruse and Matthes, 2019, 209). It is conceivable that social and political decisions were made at such events. The collective meeting and communal meal appear to represent a ritualised aspect of the meetings, as evidenced by their high frequency. Such a ritualisation may be associated with a political connotation. Furthermore, it can be assumed that they were also used to discuss and resolve conflicts (Kneisel *et al.* 2024).

CONCLUSION

It can be posited that the political development of rural or peripheral regions, such as Schleswig-Holstein, may diverge from that of more centralised areas, such as Northern Jutland. If there were chiefs, it is possible that they would have been assigned more flexible, replaceable, and, most importantly, social roles that were subject to the collective. It can be concluded that the collective held the actual power, with the chief occupying a social role. This included the capacity to make decisions, resolve conflicts, and provide social services, such as verbally representing the collective. It is possible that a chief may have been a chosen rhetorician and holder of social strategies for the group. However, the extent of their power beyond this is uncertain and should not be calculated with today's standards. In addition, it can be assumed that a chief could be removed from power through a vote.

The relatively small size of the settlements, which were probably made up of a single household, probably played a role in the decision-making process. While the collective of the small group was able to resolve everyday situations, only certain situations required the involvement of a chief. However, depending on the circumstances that necessitated it, such a system could undergo rapid change or adaptation. It is important to consider the possibility of rapid shifts in social organisation, even on an annual basis, from authoritarian to anarchic forms.

The introduction of the burial change may have resulted in the loss of previous collective practices, yet it is equally plausible that these were replaced by others. It can be reasonably deduced that cooking stone pit fields may have served as locations for the gathering of groups from a lager or regional area and thus collective decision-making process, the resolution of conflicts, or the formation of social identity.

REFERENCES

Aner, E. and Kersten K., 1978. *Südschleswig-Ost Die Kreise Schleswig-Flensburg und Rendsburg-Eckernförde (nördlich des Nord-Ostsee-Kanals),* Die Funde der älteren Bronzezeit des nordischen Kreises in Dänemark, Schleswig-Holstein und Niedersachsen 4. Neumünster: Wachholtz.

Aner, E. and Kersten K., 1991. *Dithmarschen*, Die Funde der älteren Bronzezeit des nordischen Kreises in Dänemark, Schleswig-Holstein und Niedersachsen 17. Neumünster: Wachholtz.

Aner, E., Kersten K. and Willroth, K.-H., 2005. *Kreis Rendsburg-Eckernförde (südlich des Nord-Ostsee-Kanals) und die kreisfreien Städte Kiel und Neumünster.* Die Funde der älteren Bronzezeit des nordischen Kreises in Dänemark, Schleswig-Holstein und Niedersachsen 19. Neumünster: Wachholtz.

Aner, E., Kersten K. and Willroth, K.-H., 2011. *Kreis Segeberg.* Die Funde der älteren Bronzezeit des nordischen Kreises in Dänemark, Schleswig-Holstein und Niedersachsen 20. Neumünster: Wachholtz.

Arendt, H., 1970. *On Violence*. San Diego: Harcourt, Brace & World.

Bartelheim, M., 2022. Societies and Resources in the Bronze Age of Southern Iberia. *In:* M. Bartelheim, F. Contreras Cortés and R. Hardenberg, eds. *Landscapes and Resources in the Bronze Age of Southern Spain*, RessourcenKulturen 17, Tübingen, 2022, 11–32.

Bech, J.H. and Rasmussen, M., 2018. Thy and the outside world in the Bronze Age. Regional variations in a North Sea perspective. *In: Bech et al. 2018*, 25–106.

Bech, J.H., Eriksen, B.V. and Kristiansen K., eds., 2018. *Bronze Age Settlement and Land-Use in Thy, Northwest Denmark.* Jutland Archaeological Society Publications 102. Aarhus: Aarhus University Press.

Brück, J. and Fontijn, D., 2013. The Myth of the Chief. Prestige Goods, Power, and Personhood in the European Bronze Age. *In*: H. Fokkens and A.F. Harding, eds. *The Oxford handbook of the European Bronze Age*. Oxford: Oxford University Press, 197–215.

Donat, P., 2018. *Häuser der Bronze- und Eisenzeit im mittleren Europa*. Langenweissbach: Beier & Beran.

Felding, L., 2022. *Relational Approaches to Gender, Identity and Mobility in the Southern Early Nordic Bronze Age*. PhD Thesis. Aarhus: Aarhus University.

Fokkens, H., 2009. Die Wirtschaft der Nordischen Bronzezeit: Mehr als Getreide Säen und Vieh züchten. *In*: M. Bartelheim, ed. *Die wirtschaftlichen Grundlagen der Bronzezeit Europas*. Rahden/Westfalen: Verlag Marie Leidorf, 85–104.

Foucault, M., 1994. Le jeu de Michel Foucault. *In*: D. Defert and F. Ewald, eds. *Michel Foucault: Dits et Écrits 1954–1988*: Vol. III. 1976–1979, 206–329.

Graeber, D. and Wengrow, D., 2021. *The Dawn of Everything: A New History of Humanity*. New York: Macmillan USA.

Honeck, M., 2009. *Nichts als heiße Steine? Zur Deutung der Brenngruben der späten Bronzezeit und frühen Eisenzeit in Deutschland*, Universitätsforschungen zur prähistorischen Archäologie 166. Bonn: Habelt.

Horn, C., 2023. Warriors as a Challenge: Violence, Rock Art, and the Preservation of Social Cohesion During the Nordic Bronze Age. *European Journal of Archaeology* 26(1), 57–80.

Horn, C., Kristiansen, K., Harding, A., Ling, J., Toreld, A., Molloy, B., Klimscha, F., Pitman, D., Doonan, R. C. P., Gener, M., Lidke, G., Brinker, U., Jantzen, D., Dombrowsky, A., Dräger, J., Krüger, J., Terberger, T., Mörtz, T., Georganas, I., Bunnefeld, J.-H., Anderson, K. and Vandkilde, H., 2018. *Warfare in Bronze Age Society*. Cambridge: Cambridge University Press.

Iversen, R., 2017. Big-Men and Small Chiefs. The Creation of Bronze Age Societies. *Open Archaeology* 3, 361–375.

Sahlins, M., 1963. Poor Man, Rich Man, Big Man, Chief – Political Types in Melanesia and Polynesia. *Comparative Studies in Society and History* 5(3), 285–303.

Kneisel, J., Dörfler, W., Dreibrodt, S., Schaefer-Di Maida, S. and Feeser, I., 2019. Cultural Change and Population Dynamics in the Neolithic and Bronze Age: integrating archaeological and palaeoenvironmental evidence for Northern Germany. *The Holocene* 29(10), 1607–1621.

Kneisel, J., Loy, A.K., Nakoinz, O. and Schaefer-Di Maida, S., 2024. Konfliktvermeidung und Konfliktbeilegung in der Südzone des nordischen Kreises und Polen. *In*: M. Jung, ed. *Konfliktvermeidung und Konfliktbeilegung in Gesellschaften ohne Zentralgewalt*. Würzburg: Würzburg University Press, 443–478.

Kneisel, J. and Schaefer-Di Maida, S., in press. Frauen der Macht in Nordeuropa. *In*: T. Mörtz and J. Diemke, eds. *Krieger*innen. Frauen und Gewalt im Altertum, IPHIS*, Beiträge zur altertumswissenschaftlichen Genderforschung. Trier: WVT Wissenschaftlicher Verlag.

Kristensen, I.K., 2008. Kogegruber – i klynger eller på rad og række. *Kuml* 57, 9–57.

Kristiansen, K., 2006. Cosmology, economy and long-term change in the Bronze Age of Northern Europe. *In*: K.-G. Sjögren, ed. *Ecology and economy in Stone Age and Bronze Age Scania*. Lund: National Heritage Board, 171–193.

Kristiansen, K., 2018. The rise and fall of the Bronze Age societies in Thy, northwest Jutland. *In: Bech et al. 2018*, 107–132.

Kristiansen, K. and Earle, T., 2015. Neolithic versus Bronze Age Social Formations: A political economy approach. *In*: K. Kristiansen, L. Šmejda and J. Turek, eds. *Paradigm Found. Archaeological Theory Present, Past and Future*. Oxford: Oxbow Books, 234–247.

Kristiansen, K. and Larsson, T.B., 2005. *The Rise of Bronze Age Societies. Travels, Transmissions and Transformations*. Cambridge: Cambridge University Press.

Kruse, P. and Matthes, L., 2017. Samlende pladser Social organisation og kommunikation i bronzealderen. *Arkæologisk Forum* 36(2), 25–31.

Kruse, P. and Matthes, L., 2019. Vieh, Laub und Versammlungsplatz – soziale Organisation in der Bronzezeit, Beispiel Brunde/Egelund, *Acta Archaeologica* 90(2), 203–251.

Meller, H., 2019. Fürsten, Goldwaffen und Armeen. Überlegungen zum Goldfund von Dieskau und dessen möglicher Herkunft aus dem frühbronzezeitlichen Großgrabhügel Bornhöck bei Dieskau, Saalekreis. *In*: H. Meller and F. Bertemes, eds. *Der Aufbruch zu neuen Horizonten. Neue Sichtweisen zur europäischen Frühbronzezeit. Abschlusstagung der Forschergruppe FOR550 vom 26. November 2010 in Halle (Saale).* Tagungen des Landesmuseums für Vorgeschichte Halle 19. Halle (Saale): Landesmuseum für Vorgeschichte, 101–111.

Risch, R., Meller, H., Delgado-Raack, S. and Schunke, T., 2021. The Bornhöck Burial Mound and the Political Economy of an Únětice Ruler. *In*: S. Gimatzidis and R. Jung, eds. *The Critique of Archaeological Economy*. New York: Springer, 85–116.

Schaefer-Di Maida, S., 2022. Current Research on Bronze Age 'Cooking Stone Pits' in Northern Germany and Southern Scandinavia. *European Journal of Archaeology* 25(4), 463–482. https://doi:10.1017/eaa.2022.19

Schaefer-Di Maida, S., 2023. *Unter Hügeln. Bronzezeitliche Transformationsprozesse in Schleswig-Holstein am Beispiel vom Fundplatz von Mang de Bargen, Bornhöved (Kr. Segeberg),* Scales of Transformation in Prehistoric and Archaic Societies 16. Leiden: Sidestone.

Schaefer-Di Maida, S., 2024. The Evil Twin: The Older Bronze Age Ceramic Typology of the Nordic Circle. *Praehistorische Zeitschrift* 99, 655–678. https://doi.org/10.1515/pz-2023-2035

Schaefer-Di Maida, S. and Kneisel, J., 2023. The Urnfield Phenomenon in Schleswig-Holstein: New insights into the chronology and Hypotheses. *In*: H.A. Rose, L. Christensen and A.J. Louwen, eds. *Beyond Urnfields – New Perspectives on Late Bronze Age – Early Iron Age Funerary Practices in Northwest Europe*, Schriften des Archäologischen Landesmuseums, Ergänzungsreihe 16. Kiel: Verlag Ludwig, 117–132.

Schaefer-Di Maida, S., Laabs, J., Wunderlich, M., Hofmann, R., Piezonka, H., Kreuz, P.-A., Sabnis, S., Brozio, J.P., Dickie C. and Furholt, M., 2024. Scales of Political Practice and Patterns of Power Relations in Prehistory. *In*: J. Müller, W. Kirleis and N. Taylor, eds. *Perspectives on Socio-environmental Transformations in Ancient Europe. Quantitative Archaeology and Archaeological Modelling*. Cham: Springer, 257–342. https://doi.org/10.1007/978-3-031-53314-3_9

Schaefer-Di Maida, S., Kneisel, J. and Knipper, C., in prep. *Custom is lord of all – The Bronze Age spread of the cremation custom in Northern Germany*.

Schmidt, J.-P., 2014. Garküchen auf freiem Feld? – Feuerstellenplätze im Trassenverlauf von OPAL und NEL. *In*: D. Jantzen, L. Saalow and J.P. Schmidt, eds. *Pipeline Archäologie. Ausgrabungen auf den großen Ferngastrassen in Mecklenburg-Vorpommern. Schwerin*: Schwerin Landesamt für Kultur und Denkmalpflege Mecklenburg-Vorpommern, Abteilung Landesarchäologie, 145–156.

Schmidt, J.-P. and Forler, D., 2003. Ergebnisse der archäologischen Untersuchung in Jarmen, Lkr. Demmin, und die Problematik der Feuerstellenplätze in Norddeutschland und dem südlichen Skandinavien. *Bodendenkmalpflege in Mecklenburg-Vorpommern, Jahrbuch* 51, 7–79.

Sørensen, M.L.S., 2010. Households. *In*: T.K. Earle and K. Kristiansen, eds. *Organizing Bronze Age Societies*. Cambridge: Cambridge University Press, 122–154.

Svanberg, F., 2005. House Symbolism in Aristocratic Death Rituals of the Bronze Age. *In*: T. Artelius and F. Svanberg, eds. *Dealing with the Dead. Archaeological Perspectives on Prehistoric Scandinavian Burial Ritual*, Riksantikvarieämbetet Arkeologiska undersökningar skrifter 65. Stockholm: National Heritage Board, 73–98.

Stanish, C., 2017. *The Evolution of Human Co-operation. Ritual and Social Complexity in Stateless Societies*. Cambridge: Cambridge University Press.

Weber, M., 1980. *Wirtschaft und Gesellschaft. Grundriss der verstehenden Soziologie*. Herausgegeben von Johannes Winckelmann 5. Aufl. Tübingen: Mohr Siebeck.

Widmann, E., 2007. *Die Archäologie des Haushalts in der kretischen Neupalastzeit – Archäologische und ikonographische Zeugnisse zum alltäglichen Bereich*. Daidalos – Heidelberger Abschlussarbeiten zur Klassischen Archäologie 1. Heidelberg: Propylaeum.

From Stone to Bronze in Scandinavia – Tradition and Transformation

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KEYWORDS: *equality-inequality, disruption, big houses, warriors, traumata, mounds*

"Die Menschen machen ihre eigene Geschichte, aber sie machen sie nicht aus freien Stücken, nicht unter selbstgewählten, sondern unter unmittelbar vorgefundenen, gegebenen und überlieferten Umständen."
(Karl Marx und Friedrich Engels 1852/1972, 115–123)

Abstract

This essay celebrates Professor Johannes Müller and his promotion of novel studies of inequality in the past. Here we reconsider the formation of the Nordic Bronze Age and the frictions that arose when a strong collective tradition was challenged by the new opportunities for individual enrichment available in a global bronze-led network, from *c.* 2100 BCE. What impact did this have on the scale of (in)equality? The pilot conclusion is twofold:

1. The Europe-wide disruption *c.* 1700 to 1600 BCE reinforced (rather than undermined) communal traditions locally. Thereby tradition-entrenched collective agency could impede individual access to wealth.
2. In the two major periods of flourishing connectivity and metal-for-amber trade, from 2100 to 1700 BCE and 1500 to 1300 BCE, social asymmetries did emerge although they materialised differently. After 1600 BCE, an aristocratic societal order expanded and consolidated. Corporate strategies and ideologies were resilient but were kept in check or reformulated. This tentative conclusion is sustained by a survey of burial equipment, monumental evidence, and metal hoarding. Insights are added from ongoing investigations of skeletal trauma, three-aisled longhouses, and burial mounds.

Zusammenfassung

Dieser Aufsatz ist eine Hommage an Professor Johannes Müller und seine innovativen Studien über Ungleichheit in vergangenen Zeiten. In diesem Artikel untersuchen wir die Entstehung der nordischen Bronzezeit und die Spannungen, die entstanden, als die vormals starke kollektive Tradition durch die neuen Möglichkeiten individueller Bereicherung in einem globalen, von Bronze geprägten Netzwerk ab ca. *2100 v. Chr. in Frage gestellt wurden. Welche Auswirkungen hatte dies auf den Grad der (Un-)Gleichheit? Die vorläufige Schlussfolgerung ist zweifach:*

1. *Die europaweite Zäsur um 1700–1600 v. Chr. stärkte (und untergrub nicht) lokale Gemeinschaftstraditionen. Dies führte dazu, dass traditionell verankertes kollektives Handeln den individuellen Zugang zu Reichtum behindern konnte.*
2. *Soziale Asymmetrien traten, wenn auch mit unterschiedlichen Auswirkungen, in den beiden Hauptperioden auf, in denen die Vernetzung und der Tausch von Bernstein gegen Metall florierten: 2100–1700 v. Chr. und 1500–1300 v. Chr. Nach 1600 v. Chr. breitete sich eine aristokratische Gesellschaftsordnung aus und verfestigte sich. Die korporativen Strategien und Ideologien erwiesen sich als widerstandsfähig, konnten aber in Schach gehalten oder neu formuliert werden Diese vorläufige Schlussfolgerung wird durch die Analyse von Grabbeigaben, monumentalen Zeugnissen und Metalldeponierungen gestützt. Hinzu kommen die Ergebnisse der laufenden Untersuchungen an Traumata, dreischiffiger Langhäuser und der Grabhügel.*

ON THE FORMATION OF THE NORDIC BRONZE AGE: PRELIMINARIES

The Nordic Bronze Age has long inspired discussions about its social organisation, especially whether egalitarianism or hierarchy ruled and how either possibility is attested in the material record. Especially the Neolithic-Bronze Age transition has attracted contrasting opinions (Vandkilde 1996, 259). Interpretations typically favour either the view that collectively inclined tribes prevailed throughout, *or* that formalised inequalities in the shape of chiefdoms took over early in the Bronze Age, accelerating social development towards the Iron Age and state formations. More nuanced studies have lately appeared showing that previous conclusions are merely tentative and promoting discussions that are ongoing (Ling *et al.* 2018; Vandkilde 2019; Müller and Vandkilde 2020; Großmann 2021; Bunbury *et al.* 2023; cf. Kristiansen 2014). The period of transition was long-drawn, ranging from demographic and cultural diversity at the outset to the relative unity of the Nordic Bronze Age from *c.* 1500 BCE. This is certainly relevant when searching for scales of transformation and (in)equality, which is precisely what we aim for in this essay, albeit in a selective and tentative way. A lead chapter is followed by thematic insights from ongoing investigations of skeletal trauma, two-aisled longhouses, and burial mounds.

Scandinavia	NBA IA, NBA IB	BC	Europe	Reinecke		Nordic society: proposed tendencies	
Late Neolithic II	LN II: rise	2100 –	EBA	A1-A2a	Únětice	Stability	Rising inequalities
Nordic Bronze Age IA	NBA IA: bust	1700 –	late EBA	A2b -A2c	Crisis	Instability	Europe-wide crisis, corporate strategies
Nordic Bronze Age IB	NBA IB: rise	1600 –	early MBA	Br B1-	Tumulus	Formative	Aftermath of crisis, new leadership ideas
Nordic Bronze Age II	NBA II: boom	1500 –1300	full MBA	Br B2- C	Tumulus	Stability	Warrior aristocracy, rising inequality

Fig. 1. Chronology,[1] synchronisation, and an attempt to summarise main social trends.

HISTORY-MAKING AND THE CONSTITUTION OF SOCIETY

According to Marx, humans do not only make their own history, but they do so under circumstances that owe much to their past.[2] This *duality of structure*, on the one hand, enfolds traditions established in prior periods and, on the other hand, acknowledges that human beings make their own future through their creativity and curiosity about the wider world (cf. Giddens 1984). Tradition is a strong force and not easily changed (Sahlins 2005). When examining the archaeological record for (in)equalities, inherited tradition should be considered along with the entrepreneurship required to obtain bronze, in many cases from distant destinations. Entrepreneurship, however, fits both non-profit reciprocal exchange and profit-oriented systems allowing the accumulation of wealth. Integration into a global reality may equip key actors with advantages on a local level, which might push a communal tradition towards compromise solutions (Vandkilde 2019). Another challenge for any society is a severe, boundless crisis, as this would increase mobility, violence, and resource scarcity, as well as endanger the far-ranging networks that are crucial to the supply of metal. In general, however, crisis nourishes traditional values and social cohesion (Großmann 2021, 21).

ABOUT INEQUALITY AND EQUALITY

Firstly, inequality and equality do not exclude one another (Fig. 2): Few, if any, societies in world history have been completely free of inequality and injustice, and conversely, few hierarchical societies will be free of cooperatives. According to recent sociological theory,[3] equality and inequality rather occur on a scale. This translates into more or less of each, as continua or entanglements rather than fixed categories. Furthermore, inequality, past or present, has multiple expressions, dimensions, and degrees that are influenced by social variables such as gender, age, ethnicity, kinship, ideology, and culture. In archaeological research, it

1 Chronology is conservative similar to Bunbury *et al.* 2023.

2 'Past' is here understood as social, cultural, and material traditions that would potentially either constrain or enable novel agendas.

3 See Großmann 2021 for an insightful introduction to new theories of inequality/equality.

The inequality-equality scale with variables
Basics
Inequality takes multiple forms and degrees for example from status group to aristocracy and class
Influential factors are strong social determinants like gender, ethnicity, kinship, ideology, and culture

Connected scales
The range from *influence* obtained through prestige to *dominance* obtained through violence
Social rules determining resource and wealth appropriation may be distributive, accumulative or both
Increasing inequality will mobilize increasing resistance from below

Other variables influencing (in)equality
Increasing group size and population growth will increase inequality
Good Times favour inequality whereas Bad Times favour equality and collective agency
Control of key innovations (e.g. horses, weapons, agriculture, metallurgy) facilitates inequality
Scarcity in food, land or other key resources likely support wealth inequality
Possession of capital (economic, cultural, social) supports privilege and exclusionary power

Fig. 2. (In)equality in sync with Ralph Großmann (2021, 17–23).

may be fruitful to pursue and identify scales of transformation, looking for *durée*, breaks and new formations, as well as asymmetries between or within social groups.[4] Moreover, authority may be acquired through status and prestige, whereas dominance may require violence or the threat of its use.

Secondly, (in)equalities can transpire at different levels. Inequality may manifest itself already at the household level, with gendered distinctions between free and unfree members, underpinned by kinship genealogy (Mittnik *et al.* 2019). However, ancestral roots can be imagined (rather than strictly biological) and claims can find strong material expressions serving to prove ancestry and declare belonging in a competitive manner. Beyond the household level, scales of (a)symmetry are expressed in our case in the megalithic traditions of corporate burial, standing in some contrast to the thousands of mounds with individual burials. The comparison of houses reveals social and economic networking, but also emerging inequality expressed in diverging house sizes.

Thirdly, control over desirable resources is frequently emphasised as a key variable in generating inequalities, ever so often reinforced by ideology and religion as potent sources of power (Mann 2012). Although social rules innate to tradition may demand equal distribution of resources among community members, these same rules may be negotiated in times of change. Integration into global networks is known to challenge tradition, to change the rules of the game, in a manner of speaking, hence open the way for individual accumulation and material display (Sahlins 2005; Kristiansen 2007; Vandkilde 2019; cf. Müller 1994; Müller and Windler 2016). Innovation thereto offers a scaffold for maintaining control as a group or an individual. Relevant here may be metalwork production (cf. Nørgaard 2018) and access to bronze, in addition to military expertise involved in handling specific gear for war or managing horses, for example. Economic capital may then not suffice. Rather, social capital may be decisive. This would include knowledge of how to use innovations or how to understand rules embedded in 'culture' (Bourdieu 1984). Possession of capital will support privilege and exclusionary power, drawing on landed property or prestige goods, as well as expensive vehicles for sea and land transport, together with the expertise to manage them (cf. Earle 1997). There is then the possibility that access to capital wealth was a

4 However, it will be difficult to decide whether such groups were institutionalised, that is delineated by rigid rules for who had access to a specific peer group and who had not.

career enhancing factor even for born outsiders (Raffield *et al.* 2016; Ling *et al.* 2018).

Fourthly, increasing population or group size, as well as scarcity of food and key resources, may well enable wealth inequality. It is thus surprising that crisis — bad times with disaster and conflict — tend to uphold society's cooperative resources. Good times, on the other hand, encourage unequal relations, even if they are countered by cooperative strategies that survive in sub-groups. In sum, Marx' duality of structure combined with recent theoretical thinking make it worth evaluating, through selected data, the idea of (in)equality as scales that build on previous structures and accomplishments, while also looking for marked breaks, collapse, and new formations regionally and supra-regionally. Guidance is provided by the *hypothesis* that the constitution of the Nordic Bronze Age, as known from the boom period 1500–1300 BCE, emerged through human actions that were impacted by inherited social structures, prior collapses, and Europe-wide reorganisations (*e.g.* Kristiansen 1998).

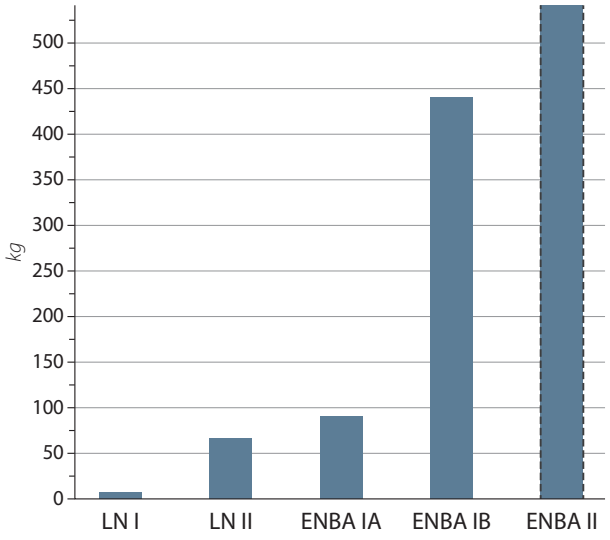

Fig. 3. Social consumption of metal 2400–1300 BCE. The boom in the NBA II (Nordic Bronze Age) is indicated with an open-ended dashed line as a conservative estimate based on metalwork in multiple burials and hoards. At this time imports of bronze probably amounted to tons.

DURÉE, BREAKS AND NEW FORMATIONS: (IN)EQUALITIES 2100–1300 BCE

Demands for exogenous metals were probably an important driving force in the transformations manifested in the archaeological record (Figs. 2–4).[5] From the onset of the Bronze Age, Southern Scandinavia relied on regular supplies of metal, which, due to the sheer amounts, must have been commodified and almost certainly traded for amber (Vandkilde *et al.* 2024). This raises the question of whether, in this process, originally corporate (distributive) strategies underwent a transformation into centralising (exclusionary) strategies.

Surplus capital must surely have financed long-distance travels over sea and land (Ling *et al.* 2018), whereby networks were sustained and dependencies established. It was quite a vulnerable system, much dependent on steady flows of incoming metals (cf. Nørgaard *et al.* 2019; 2021). In the archaeological sources, *c.* 2100–1300 BCE, there is, however, no evidence that this trade was markedly centralised.[6] Rather, individual agency played a key role in the acquisition and appropriation of bronze. Successful individuals or groups resided at favourable coastal locations where metals and other goods were landed. Pile in Scania is an early example, and many other *landing places* must have existed throughout the Bronze Age.

'From stone to bronze' witnessed a comprehensive recalibration of Nordic societies over 800 years or more. It was a major historical turn or rather a series of such turns that we are only beginning to grasp. This considerable span of time embraced both stable and unstable periods, which were affected by hyper-scale crisis and reorganisations (Fig. 1). Communal traditions formed part of it from the onset, but even entrenched traditions changed and new traditions were introduced and became established. A case in point is the breakthrough of the Early Nordic Bronze Age at *c.* 1600 BCE and its consolidation at *c.* 1500 BCE with the frenzied, almost megalomaniacal construction of burial mounds in the thousands (Holst *et al.* 2013). In addition, the creation of exquisite metalwork enhanced personal appearance and warfare (cf. Nørgaard 2019; Nørgaard and Reiter 2020). This was a bricolage of novelty and tradition that developed over several centuries and periods. Figure 4 intends to capture continuities, breaks and new formations, presented as timelines, hence enabling a discussion of major societal trends.

5 In Scandinavia, the great boom in metal import occurred around 1600–1500 BCE when large amounts of chalcopyrite from the Italian Alps arrived. This scenario may not match Central Europe (see Rassmann 2011).

6 The Late Bronze Age, however, shows centralising trends that may connect to political authority in the making (*e.g.* Kristiansen 1998; Vandkilde *et al.* 2022).

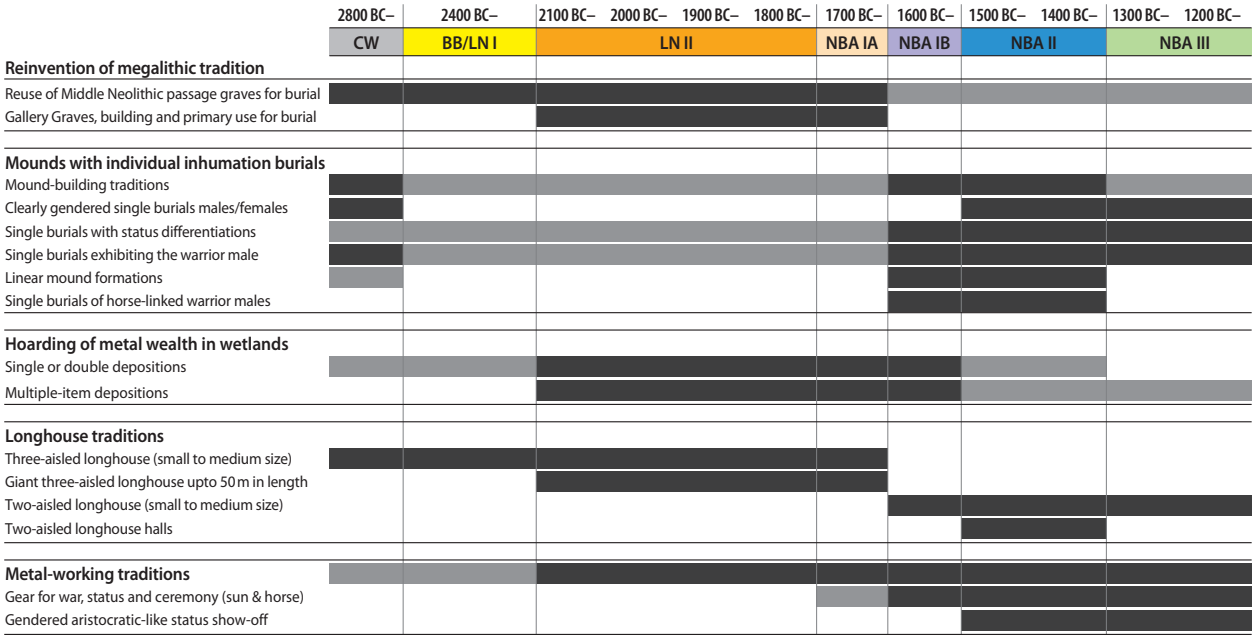

Fig. 4. Durée, *breaks and new formations as social indicators (**CW**: Corded ware, **BB**: Bell Beaker).*

Late Neolithic II (LN II) rising inequalities kept in check by deep-seated communal tradition

When metals first arrived in Scandinavia *c.* 2100–1700 BCE, they were channelled into traditional domains. Metals were rarely used to mark individual status[7] and were instead invested in ceremonial exchanges and deposited in wetlands. In hindsight, this matched local Neolithic traditions for managing wealth but also equalled the dominant tradition in the Únětice region that supplied much of the metal (Nørgaard *et al.* 2019; 2021; 2022). This is testimony to the social muscle of corporate groups reflected in the preference for burial in megalithic monuments, the hoarding of wealth in wetlands, and the traditional two-aisled long-houses. The erection and use of gallery graves from *c.* 2100 BCE exemplify reinvention of a megalithic tradition, hence the aggrandisement of collectives rather than individuals.

Despite such communal manifestations of might, there are signs of emerging inequality, linked to the incoming metals that are likely to challenge rooted tradition. Dissimilarity in the size of longhouses is a clear sign of asymmetries at the household and village level (Brink 2013). Multi-object metal depositions, *Mappa-Mundi* hoards — so named by David Fontijn (Fontijn 2020) — appear betwixt and between: As tradition required, these remarkable collections of metalwork were deposited in wetlands, but in their content, they rather referred to individual endeavours abroad. The giant longhouses built for individual successful households (Johannsen 2017) is another sign that tradition was under pressure. At the same time, houses and households were economically networked, demonstrating integration into the community (Brink 2013). Overall, the period exhibits population growth, a thriving subsistence economy and the intake of new land for settlement and farming (Brink 2013; Vandkilde 2017; 2019; Johannsen 2017).

Nordic Bronze Age IA (NBA IA) crisis strengthens corporate tradition

This period (*c.* 1700–1600 BCE) requires further study. One new study of climate and demography however confirms that that NBA IA was crisis-ridden (Bunbury *et al.* 2023, figs. 6–7). It appears as a wide-ranging disruption connected to the decline and collapse of the Únětice intersociety before 1600 BCE (*ibid.*; Kneisel 2013; Nørgaard *et al.* 2019; 2021). This impacted the metal-for-amber trade, which collapsed or destabilised.

7 Whereas flint daggers, emulating those of bronze, seem more connected to individual status and gender in the burial domain, metal daggers were however mostly found in communal grave chambers. In rare cases, the burial goods included small metal trinkets.

Certainly, a large proportion of metalwork from this period in Denmark was made from recycled metal, but there are also new supplies and technological advances in alloying practices, as well as the serial production of novel axes and the first socketed spearheads made for war (Nørgaard *et al.* 2019; 2021). The warlike component is also evident in finds such as the gallery grave at Over-Vindinge, Zealand (Tornberg and Vandkilde in prep.). NBA IA resembles LN II in its emphasis on communal tradition, with few signs of status differentiation or otherwise individual access to wealth. Less than twenty burials with metalwork, mostly small trinkets, have been recorded from this period, mostly from megalithic chambers. Furthermore, hoarding of metal valuables continues as the dominant mode of deposition and new dryland sites appear alongside those in wetlands (Vandkilde 1996, 219 fig. 232; Rassmann *et al.* 2015). This is the last period of the two-aisled longhouse (cf. Sparrevohn *et al.* 2019). In short, the wide-ranging crisis with evidence of conflicts reinforced (rather than undermined) the local socio-cultural tradition in Scandinavia. A power void may have been generated, laying the ground for the social transformations that began after 1600 BCE.

Nordic Bronze Age IB (NBA IB) aftermath of crisis – circulating ideas of aristocratic leadership

NBA IB (*c.* 1600–1500 BCE) is a composite period with long standing and entirely new components occurring entangled. The old tradition of channelling wealth into corporate domains was invigorated when long-range metal-for-amber connectivity was re-established in the aftermath of crisis. This first brought Hajdúsámson-Apa type warrior gear from the Carpathian Basin to Southern Scandinavia, where it stimulated creative emulations of swords, daggers, shafthole-axes, spearheads, and even ship-shaped ceremonial swords (Kaul 1998; Maran 2022; Vandkilde 2022; cf. Berger *et al.* 2021). This warrior gear was ceremonially mostly disposed of in wetlands and may have had prior ceremonial uses, perhaps connected to cults celebrating the sun.[8]

Around this time, *c.* 1570 BCE (cf. Maran 2022, 460), a new tradition was founded, drawing on ideas of the aristocratic charioteering and sword-wielding war leader: an image circulating from Mycenae to Scandinavia (cf. Vandkilde 2006; 2020). Burials now appear of males displayed in a high-status manner as both charioteers and sword-wielders. They may represent the founders of a new tradition for monumental mounds in Eastern Denmark and in Scania, drawing on the rising Tumulus complex in the Danubian region. Mounds were at this time also built in Jutland and Northern Germany (Sögel-Wohlde burials). Together, these mounds were the first ones in an immense building project that came to comprise 40,000–50,000 mounds or more. Legitimation of individualising authority would have been important and may have drawn on a reinvention of the Corded Ware tradition of mound burials in Western Jutland (3rd millennium BCE); In both, female companions appear to be missing in the founder-burials of the first generation. The gender bias NBA IB may hypothetically be explained in terms of in-migration of surplus males from Tumulus groups in Southern Germany and the Middle Danube. Significantly, the three-aisled longhouse was introduced in NBA IB (Sparrevohn *et al.* 2019), and this novelty in housing likely links up with the first monumental mounds.

Apart from trinkets such as dress pins of Tumulus derivation, a small suite of burials in Zealand boasts horse-related gear, especially *stimuli* used in charioteering when urging the horse to accelerate its speed (Vandkilde 1996, 223ff; 2014). Metal-hilted swords of the Valsømagle-Au type thereto represent another Tumulus-derived novelty. Furthermore, belt hooks (for fastening the male dress) may carry a well-sculpted horsehead. This horsey trait continues in NBA II, and clearly flags a particular male identity shared among equals. This evidence corroborates that the domesticated horse only arrived in Europe/Scandinavia after 2000 BCE (Kveiborg 2019; Librado *et al.* 2021) and became a symbol of supreme status upon arrival.

Overall, this seems to be a radical break with the communal tradition of keeping individuals anonymous. However, the deep-rooted tradition seems to have endured in a reframed version, underpinned by traditional ceremonies in wetlands. The twin warrior depositions at Valsømagle, Zealand, highlight two warbands with individual warriors as members including the sword-wielding war leader, to judge by the weaponry (Felding 2020; Felding *et al.* 2020; Vandkilde 2020; 2022; cf. Treherne 1995). It seems that 'community' could now comprise fellowships that bring together several distinguishable individuals. Corporate strategies and ideologies could surely be mobilised in the contexts of waging war, building burial mounds (cf. Holst and Rasmussen 2015), and organising religious ceremonies.

8 Both Rørby scimitars had a day side and a night side in analogy with the Sun-chariot from Trundholm. The ship is on the 'sunny side'.

Nordic Bronze Age II (NBA II) warrior-led aristocracy – rising inequality contained by a transformed tradition

Over the next 200 years (*c.* 1500–1300 BCE), the building of multiple mounds with individual burials bears witness to the effective expansion and consolidation of the new social tradition over large tracts of Southern Scandinavia (Kristiansen 1998; Holst *et al.* 2013). Male burials continued to emphasise weaponry, in particular, swords, axes, and spears. The horse had turned into a symbol (sun-horse), especially adorning the razor, which was important for keeping these status warriors beautiful (Treherne 1995; Kaul 2018). The female counterparts of the warriors were now for the first time, during the Bronze Age, presented in the funerary sphere as persons of worth in a primarily binary system of gender. Inequality may well have increased, yet constrained within a tightly networked system, with gender as the primary divide. The social label for this kind of social construction may be a warrior-led aristocracy — its members glued by similar heroic values — an intermediate society in-between equality and hierarchy (Graeber and Wengrow 2021; cf. van Wees 1992; Vandkilde 2006).

High- and low-status individuals may be selected, but they seem to form fellowships across notably warrior fellowships with a war-leader at the head (Felding *et al.* 2020). Eventually, these mound builders signalled belonging to the same major group, however, subscribing to segments and fellowships at different societal levels. In the end, they are all interconnected, and there is no circumscribed elite stratum that stands out among the 6,000 burials recorded (Felding 2020; Vandkilde *et al.* 2024).

However, a minority proportion of these mound burials appears non-gendered and often poor in burial equipment: Their position in society is quite unclear (*ibid.*), but hypothetically they represent low-status or unfree individuals in the households (cf. Mittnik *et al.* 2019). In addition, megalithic chambers continued to be used for burial to an unknown extent, probably varying from region to region, during the Early NBA while the relationship to 'the mound builders' is unclear as well.

From *c.* 1500 BCE, metal-for-amber trade with Tumulus groups in Southern Germany brought Trentino metal to Scandinavia in very large amounts, outcompeting most other ore sources (Nørgaard *et al.* 2022). The European MBA (see Fig. 1) was overall industrious and *perhaps* mostly peaceful and stable, despite, or perhaps because of, the military might that secured the crucial metal-for-amber trade. Yet skeletal data must be consulted to validate the hypothesis of status warfare and relative peace.

Fig. 5. Severe but healed skull trauma (c. ø 6x6 cm) of the left parietal of a male from grave 15, mound I in Abbekås, southernmost Sweden. Surgical intervention in the form of trepanation may have followed the injury, but there is no clear evidence of scrape or cut marks. ^{14}C-date: UBA-22838 3111 ± 35 BP, 1451–1271 cal BCE (Tornberg 2018a), corresponding to NBA II (Photo: Anna Tornberg).

BIOARCHAEOLOGICAL INSIGHT: BIG-BONED HEROES? [9]

There has long been a consensus among bioarchaeologists that the people who inhabited Scandinavia in the Late Neolithic — Nordic Bronze Age (LN-NBA) were tall, as indicated by skeletal long-bone lengths. The increase in average statures between generations is assumed to accurately reflect improved living conditions such as housing, disease history, and nutrition (*e.g.* Steckel 1995; Cole 2003; Stinson 2012). Dramatic shifts in the gene-pool would potentially contribute to such increases (Stinson 2012, 601). Male statures are more likely to change with poor/beneficial living conditions due to a biological investment in lean weight (stature) with excess energy, rather than body fat as in females (Wells 2007). It is nonetheless evident that the

9 Anna Tornberg has authored this section. 'Big bones' refers to Hesiod's idea of an age of heroes described in his "Work and Days". The Heroic Age was preceded by the gold and silver ages and succeeded by his own dark time, the Iron Age. The heroic period is likely a historical-mythical reference to the Greek Bronze Age as inhabited by fierce epic warriors and demi-gods (Albersmeier 2009).

LN-NBA males and females were tall; mean living statures of over 173 cm for males and 160–165 cm for females (Tornberg 2018b). Male statures of 180–190 cm have been estimated in several cases (Tornberg 2015). These are statures comparable with modern day Canada and Turkey.

The increase in tallness (quite dramatic) began in the Corded Ware complex (CWC). The difference in *male average statures* between the CWC, the preceding Funnel Beaker culture, and the partly contemporaneous Pitted Ware complex, is almost 10 cm. *Female statures*, by comparison, have increased more linear from the final Mesolithic to the earliest Bronze Age, perhaps decreasing slightly in NBA II (Tornberg 2018b).

The reason for the increase in stature is probably multifactorial, including population growth and new genetic input, as well as the quality of nutrition. *Lactase persistence* is closely associated with the CWC (Allentoft *et al.* 2015). Lactase persistence is coupled to the intake of dairy products and together they contribute markedly to the increased statures in prehistoric Europe (Stock *et al.* 2023). Although high stature and moderate levels of physiological stress (Tornberg 2013; Blank *et al.* 2018) might at first glance reflect a harmonious society with relatively thriving populations, a closer look at the skeletal data shakes the very foundation of such assumptions.

The Late Neolithic — Early Nordic Bronze Age populations were continuously affected by violence. Around 10 % of the population in Southern Sweden, both males and females, suffered from violence-related skull trauma. Most violent encounters were nonlethal, but a substantial number had deadly outcomes (Tornberg 2022). Males predominantly evidence healed traumata (see Fig. 5), while females more often died from their injuries. This likely reflects different levels of conflict: warfare versus war-related assault. There are possible differences in the frequency of violence associated with different types of burial, with the highest incidence associated with gallery grave and barrow inhumations. Geographical differences cannot be ruled out and sociocultural differences are plausible. All recorded skull traumata were caused by blunt force on the left frontal bone and right parietal bone as the most frequent locations. This can suggest both face-to-face combat and violence inflicted from behind (*ibid.*). Some healed traumata reveal ferocious warfare, but oppositely indicate surgical intervention and care attendance on a regular basis (Fig. 5). It is very likely that the actual levels of conflict were substantially higher than those measured in skeletal remains. Sharp force assaults (*e.g.* using swords) primarily target soft tissue (as do projectiles), hence only occasionally leave marks on the bone.

The relative occurrence of sharp projectile and blunt force trauma at the Tollense battlefield, Northern Germany, dated to the NBA III, informs that merely 7 % of the individuals showed evidence of healed or unhealed skull trauma (Brinker *et al.* 2016; Horn 2021). This puts the Southern Swedish trauma levels in perspective. Examining the human demography during the transition from stone to bronze has only just begun. High-definition data is needed, especially regarding variations in time and space. The high level of violence indicates war-related violence and, due to finds of professional weaponry, likely also warriors in action. Overall, this is in tune with the above argumentation of status warriors in action and/or tribal warfare albeit it is surprising that females were inflicted to such a high degree (cf. van Wees 1992; Vandkilde 2006).

THE MONUMENTAL TWO-AISLED LONGHOUSE [10]

Scholars have debated the question of a socio-economic elite already in the Late Neolithic period; among these Helle Vandkilde (2017; 2019), John Simonsen (2017), and Rune Iversen (2017). Consensus remains elusive, probably due to the ambiguity of the relevant data material. If extraordinary finds represent extraordinary people, the seemingly clearest indication of any marked social inequality is the monumental longhouse that appeared around 2000 BCE. These impressive two-aisled buildings were up to 45 m long and eight metres wide, and thereby three times the size of average contemporary three-aisled longhouses. In discussions of social change, their extreme size and similarity to supposed elite residences in Únětice Central Europe are a focal point. The houses are often suggested to represent powerful people and are sometimes even referred to as halls (*e.g.* Iversen 2017), hence implying functions similar to the halls of the late Iron and Viking Age. However, their internal layout and finds show that their function was more comparable to the numerous smaller, contemporaneous houses: They were the dwelling of a particular household while also framing its agricultural production: a farmhouse, although of extreme size (Johannsen 2024).

10 Jens Winther Johansen is the author of this section reflecting the results of a PhD project.

The emergence of monumental farmhouses marks the culmination of a re-neolithisation, which took off at the beginning of the Late Neolithic period. This transpired as an intensification of cereal cultivation and animal husbandry in turn leading to increased food production and population growth (Johannsen 2023; Johannsen *et al.* 2024). Archaeological studies of elite groups usually emphasise the key role of 'surplus products', which in short are food products strategically generated on top of what is necessary for biological survival. Cultural assets flagged by elite groups (like elaborate graves and prestige goods), are often preconditioned by their manufacturers being controlled by the very persons who succeeded in creating surplus produce in the first place (Hansen 2021). Agricultural intensification must thus be seen as a precondition for mobilising power during the later part of the Late Neolithic period, *c.* 2100–1700 BCE. At this time, the monumental Late Neolithic farmhouse materialised symbolising resource abundance and thereby wealth and authority.

MOUND *DURÉE*: MANIFESTATION OF A TIMELESS ARISTOCRATIC ETHOS? [11]

Perhaps as many as 200,000 earthen mounds were built across the Southern Scandinavian landscapes, generating lines and groups in a lengthy process. Together these monuments formed a 1600-year *durée* of mound erections and individualised interments in Southern Scandinavia (Hübner 2005; Holst *et al.* 2013). This section hypothesises that the mounds manifested an aristocratic ethos; a material statement of the genealogy of peer groups of males and females, meant to be eternal, sacred, and written into a shared past and future. The mound tradition is anchored in the spread of the Corded Ware complex in the early 3rd millennium BCE now confirmed to be linked to in-migrations (*e.g.* Allentoft *et al.* 2015), but also locally embedded. Fluctuations existed in building intensity, with peaks during the Corded Ware period and in the Early Nordic Bronze Age (Holst *et al.* 2013). On estimation, 40,000–50,000 mounds were erected during NBA II–III, showcasing an immense boom in mound construction during this period.

Cultural unity resided over huge tracts of land, driven by common sociocultural codes for mound building, burial rituals, and for personal appearance in the lived life of males and females. This synchronised as well as gendered theme first appeared in the Corded Ware period and then transferred into the Early NBA, albeit now materially transformed to fit a new world clad in bronze. The repeated pattern from the Corded Ware period to the Bronze Age may indicate some form of reinvented tradition, despite the hundreds of years separating the two, but kept alive in memory, tales, and myths. It is comparable to the Late Bronze Age and the Viking Age where the erection of larger barrows after a break were renewed.

Speculatively, ethnicity and in-migration may be considered as influential factors. Status differences and small-scale inequalities occur in the peer group of males and females, but no marked internal asymmetries. Despite a robust dataset of 6,000 burials, recent research has failed to identify an upper class (Felding 2020). Rather, the interest should be directed to the fact that perceived equality was mediated to peer group members near or far. To outsider groups, however, the unity and superiority communicated through mounds and individual appearances must have been daunting. We still need to identify the outsider groups.

Male burials appear to be particularly stereotyped, as if institutionalised warriorhood was meant to mediate belonging to a group of peer warriors (*e.g.* Harding 2000; Bourgeois and Kroon 2017; Felding *et al.* 2020). The battle-axe is the symbolic marker of some Corded Ware males, with a clearly defined function as a weapon to which archery equipment (arrowheads) can be added (Vandkilde 2018). The gear of the warrior shifted over time, while acquiring an epic component in the Early NBA through the sword first and foremost. With the intensification of mound constructions, as many as 50,000 swords may have been produced over a 500-year period (Bunnefeld 2016, 196–198). The notion of the aristocratic couple as either the founders of or the descendants of distinguished lineages appears to be the backbone of the mound boom and *durée*, and tightly linked to the metal-for-amber exchange (Vandkilde *et al.* 2024).

11 Casper Sørensen is the author of this section, which reflects the explorative first phase of a PhD project.

CONCLUSIONS

In 1852, Karl Marx famously theorised that history is driven by a dual construct of inherited tradition and individual action. He was much inspired by his own time, when history had resumed a repetitive pattern with the revival of the Bonapartist tradition, albeit effectively challenged by progressive groups and individuals. In the present essay, we have used this Marxian theory to disclose and explain the transformation from stone to bronze in Scandinavia. The question of inequality/equality was on the top of the agenda together with identifying breaks, collapses, and new formations, hence tracking social change over several stages.

Clearly, tradition was not a constant during the long stone-bronze transition, but constantly a force to cope with. It was not until after the crisis of the 17th century BCE that the strong communal principle was successfully countered to allow individual ambitions to flourish. After a critical transitional period, the 16th century BCE, the Nordic Bronze Age consolidated between *c.* 1500–1400 BCE. The display of the individual status and accomplishments of females and males now appeared as the vanguard of social life. However, there is still no circumscribed elite stratum, nor any centralisation of power, but quite a lot of war-related violence. Indeed, warriorhood was of primary importance among the males and a highly celebrated asset overall.

By then, communal efforts had retreated into the background, but could still be mobilised at extraordinary ceremonial events, such as making lavish wetland offerings and building new burial mounds (Holst *et al.* 2013). The mounds and their individualised interments are a testimony to the establishment of a new social order; in fact, a new strong and heroic tradition that was not challenged until the middle of the 13th century BCE. The relative stability of the NBA II may be explained by the thriving metal-for-amber trade, which connected Scandinavia to the rest of booming MBA Europe in the long term.

REFERENCES

Allentoft, M.E., Sikora, M., Sjögren, K.-G., Rasmussen, S., Rasmussen, M., Stenderup, J., Damgaard, P.B., Schroeder, H., Ahlström, T., Vinner, L., Malaspinas, A.-S., Margaryan, A., Higham, T., Chivall, D., Lynnerup, N., Harvig, L., Baron, J., Casa, P.D., Dąbrowski, P., Duffy, P.R., Ebel, A.V., Epimakhov, A., Frei, K., Furmanek, M., Gralak, T., Gromov, A., Gronkiewicz, S., Grupe, G., Hajdu, T., Jarysz, R., Khartanovich, V., Khokhlov, A., Kiss, V., Kolář, J., Kriiska, A., Lasak, I., Longhi, C., McGlynn, G., Merkevicius, A., Merkyte, I., Metspalu, M., Mkrtchyan, R., Moiseyev, V., Paja, L., Pálfi, G., Pokutta, D., Pospieszny, Ł., Price, T.D., Saag, L., Sablin, M., Shishlina, N., Smrčka, V., Soenov, V.I., Szeverényi, V., Tóth, G., Trifanova, S.V., Varul, L., Vicze, M., Yepiskoposyan, L., Zhitenev, V., Orlando, L., Sicheritz-Pontén, T., Brunak, S., Nielsen, R., Kristiansen, K. and Willerslev, E., 2015. Population genomics of Bronze Age Eurasia. *Nature* 522, 167–172. https://doi.org/10.1038/nature14507

Albersmeier, S., ed., 2009. *Heroes: Mortals and Myths in Ancient Greece*. Baltimore: Walters Arts Museum.

Berger, D., Brügmann, G., Bunnefeld, J.-H. and Pernicka, E., 2021. Identifying mixtures of metals by multi-isotope analysis: Disentangling the relationships of the Early Bronze Age swords of the Apa–Hajdúsámson type and associated objects. *Archaeometry* 2022, 1–31. https://doi.org/10.1111/arcm.12714

Blank, M., Tornberg, A. and Knipper, C., 2018. New Perspectives on the Late Neolithic of southwestern Sweden. An interdisciplinary investigation of the Gallery Grave Falköping stad 5. *Open Archaeology* 4, 1–35. https://doi.org/10.1515/opar-2018-0001

Bourdieu, P., 1984. *Distinction. A social critique of the judgement of taste*. New York: Routledge.

Bourgeois, Q. and Kroon, E., 2017. The impact of male burials on the construction of Corded Ware identity: Reconstructing networks of information in the 3rd millennium BC. *PLoS One* 12(10), e0185971. https://doi.org/10.1371/journal.pone.0185971

Brink, K., 2013. Houses and Hierarchies: Economic and Social Relations in the Late Neolithic and Early Bronze Age. *European Journal of Archaeology* 16(3), 433–458. https://doi.org/10.1179/1461957113Y.0000000033

Brinker, U., Schramm, A., Jantzen, D., Piek, J., Hauenstein, K. and Orschiedt, J., 2016. The Bronze Age battlefield in the Tollense Valley, Mecklenburg-Western Pomerania, Northeast Germany – Combat marks on human bones as evidence of early warrior societies in northern Middle Europe? *In:* F. Coimbra, D. Delfino, V. Sirbu and C. Schuster, eds. *Late Prehistory and Protohistory: Bronze Age and Iron Age. Proceedings of the XVII UISPP World Congress (1–7 September 2014, Burgos, Spain). Vol. 9/Sessions A3c and A16a*. Oxford: Archaeopress, 39–56. https://www.archaeopress.com/Archaeopress/DMS/F375C8EF907E44ECA1AF3AB08DB68F2D/9781784912970-sample.pdf ; last access 18th March 2025

Bunbury, M.M.E., Austvoll, K.I., Jørgensen, E.K., Nielsen, S.V., Kneisel, J. and Weinelt, M., 2023. Understanding climate resilience in Scandinavia during the Neolithic and Early Bronze Age. *Quaterary Science Reviews* 322, 1–20. https://doi.org/10.1016/j.quascirev.2023.108391

Bunnefeld, J.-H., 2016. *Älterbronzezeitliche Vollgriffschwerter in Dänemark und Schleswig-Holstein. Studien zu Form,*

Verzierung, Technik und Funktion, Studien zur nordeuropäischen Bronzezeit 3. Kiel: Wachholtz.

Cole, T.J., 2003. The secular trend in human physical growth: a biological view. *Economics and Human Biology* 1(2), 161–168. https://doi.org/10.1016/S1570-677X(02)00033-3

Earle, T.K., 1997. *How Chiefs Come to Power: The Political Economy in Prehistory*. Stanford California: Stanford University Press.

Felding, L., 2020. One Ring to Rule Them All? Appearance and Identity of Early Nordic Bronze Age Women. *Praehistorische Zeitschrift* 95, 422–446.

Felding, L., Reiter, S., Frei, K.M. and Vandkilde, H., 2020. Male Social Roles and Mobility in the Early Nordic Bronze Age. A Perspective from SE Jutland. *Danish Journal of Archaeology* 9(1), 1–167. https://doi.org/10.7146/dja.v9i0.117955

Fontijn, D., 2020. *Economies of Destruction. How the systematic destruction of valuables created value in Bronze Age Europe c. 2300–500 BC*. London: Routledge.

Giddens, A., 1984. *The Construction of Society*. Oxford: Polity Press.

Graeber, D. and Wengrow, D., 2021. *The Dawn of Everything: A New History of Humanity*. London: Penguin books.

Großmann, R., 2021. Insights into Social Inequality. A Quantitative Study of Neolithic to Early Medieval Societies in Southwest Germany, ROOTS Studies 1. Leiden: Sidestone. https://doi.org/10.59641/9zd5722b

Hansen, S., 2021. "The Economy Has No Surplus": Harry W. Pearson's Contribution revisited, 60 Years Later. *In:* S. Gimatzidis and R. Jung, eds. *The Critique of Archaeological Economy. Frontiers in Economic History*. Cham, Switzerland: Springer International Publishing, 55–70. https://doi.org/10.1007/978-3-030-72539-6_4

Harding, A.F., 2000. *European Societies in the Bronze Age*. Cambridge: Cambridge University Press.

Holst, M.K. and Rasmussen, M., eds., 2015. *Skelhøj and the Bronze Age Barrows of Southern Scandinavia: Vol. II. Barrow building and barrow assemblies*, Jysk Arkaeologisk Selskabs Skrifter 78. Aarhus: Jutland Archaeological Society.

Holst, M.K., Rasmussen, M., Kristiansen, K. and Bech, J.-H., 2013. Bronze Age 'Herostrats': Ritual, Political, and Domestic Economies in Early Bronze Age Denmark. *Proceedings of the Prehistoric Society* 79, 265–296. https://doi.org/10.1017/ppr.2013.14

Horn, C., 2021. Trouble in paradise? Violent conflict in Funnel-Beaker societies. *Oxford Journal of Archaeology* 40(1), 43–64. https://doi.org/10.1111/ojoa.12212

Hübner, E., 2005. *Jungneolithische Gräber auf der Jütischen Halbinsel: typologische und chronologische Studien zur Einzelgrabkultur*, Nordiske fortidsminder, Serie B 24. Copenhagen: Det Kongelige Nordiske Oldskriftselskab.

Iversen, R., 2017. Big-Men and Small Chiefs: The Creation of Bronze Age Societies. *Open Archaeology* 3, 361–375. https://doi.org/10.1515/opar-2017-0023

Johannsen, J.W., 2017. Mansion on the hill – A monumental Late Neolithic house at Vinge, Zealand, Denmark. *Journal of Neolithic Archaeology* 19, 1–28. https://doi.org/10.12766/jna.2017.1

Johannsen, J.W., 2023. The Late Neolithic Expansion in Denmark. Ancient and new traditions 2350–1700 BC. *Danish Journal of Archaeology* 12(1), 1–22. https://doi.org/10.7146/dja.v12i1.132093

Johannsen, J.W., 2024. Monumental Farmhouses and Powerful Farmers in Late Neolithic Denmark. *Antiquity* 98(402), 1522–1537. https://doi.org/10.15184/aqy.2024.179

Johannsen, J.W., Laabs, J., Bunbury, M.M. and Mortensen, M.F., 2024. Subsistence and population development from the Middle Neolithic B (2800–2350 BCE) to the Late Neolithic (2350–1700 BCE) in Southern Scandinavia. *PLoS ONE* 19(10), e0301938. https://doi.org/10.1371/journal.pone.0301938

Kaul, F., 1998. *Ships on bronzes: a study in bronze age religion and iconography, Publications from the National Museum*, Studies in archaeology & history 3. Copenhagen: National Museum of Denmark.

Kaul, F., 2018. The One-Edged Razor: A Vivid Medium of Creativity and Meaning. *In:* L.B. Jørgensen, J. Sofaer and M.L.S. Sørensen, eds. *Creativity in the Bronze Age. Understanding Innovation in Pottery, Textile, and Metalwork Production*. Cambridge: Cambridge University Press, 161–176. https://doi.org/10.1017/9781108344357.022

Kneisel, J., 2013. Der Übergang von der Frühbronzezeit zur Mittelbronzezeit im nordöstlichen Mitteleuropa. Lücke oder Forschungsdesiderat? *In:* J. Kneisel, H.J. Behnke and A. Schopper, eds. *Frühbronzezeit – Mittelbronzezeit. Neue Erkenntnisse zur Besiedlung zwischen Elbe und Warthe und angrenzender Regionen (2000–1400 v. Chr.). Symposium vom 24.–25. Sept. 2011 in Welzow/Brandenburg*, Studien zur Archäologie in Ostmitteleuropa 10. Bonn: Habelt, 95–120.

Kristiansen, K., 1998. *Europe Before History, New Studies in Archaeology*. Cambridge: Cambridge University Press.

Kristiansen, K., 2007. The Rules of the Game. Decentralised Complexity and Power Structures. *In:* S. Kohring and S. Wynne-Jones, eds. *Socialising Complexity: Structure, Interaction and Power in Archaeological Discourse*. Oxford: Oxbow Books, 60–75.

Kristiansen, K., 2014. Towards a new Paradigm? The Third Science Revolution and its Possible Consequences in Archaeology. *Current Swedish Archaeology* 22, 11–34.

Kveiborg, J., 2019. Traversing Sky and Earth. The Nordic Bronze Age horse in a long-term perspective. *Praehistorische Zeitschrift* 93(2), 225–264. https://doi.org/10.1515/pz-2018-0011

Librado, P., Khan, N., Fages, A., Kusliy, M.A., Suchan, T., Tonasso-Calvière, L., Schiavinato, S., Alioglu, D., Fromentier, A., Perdereau, A., Aury, J.-M., Gaunitz, C., Chauvey, L., Seguin-Orlando, A., Der Sarkissian, C., Southon, J., Shapiro, B., Tishkin, A.A., Kovalev, A.A., Alquraishi, S., Alfarhan, A.H., Al-Rasheid, K.a.S., Seregély, T., Klassen, L., Iversen, R., Bignon-Lau, O., Bodu, P., Olive, M., Castel, J.-C., Boudadi-Maligne, M., Alvarez, N., Germonpré, M., Moskal-Del Hoyo, M., Wilczyński, J., Pospuła, S., Lasota-Kuś, A., Tunia, K., Nowak, M., Rannamäe, E., Saarma, U., Boeskorov, G., Lõugas, L., Kyselý, R., Peške, L., Bălăşescu, A., Dumitraşcu, V., Dobrescu, R., Gerber, D., Kiss, V., Szécsényi-Nagy, A., Mende, B.G., Gallina, Z., Somogyi, K., Kulcsár, G., Gál, E., Bendrey, R., Allentoft, M.E., Sirbu, G., Dergachev, V., Shephard, H., Tomadini, N., Grouard, S., Kasparov, A., Basilyan, A.E., Anisimov, M.A., Nikolskiy, P.A., Pavlova, E.Y., Pitulko, V., Brem, G., Wallner, B., Schwall, C., Keller, M., Kitagawa, K., Bessudnov, A.N., Bessudnov, A., Taylor, W., Magail, J., Gantulga, J.-O., Bayarsaikhan, J., Erdenebaatar, D., Tabaldiev, K., Mijiddorj,

E., Boldgiv, B., Tsagaan, T., Pruvost, M., Olsen, S., Makarewicz, C.A., Valenzuela Lamas, S., Albizuri Canadell, S., Nieto Espinet, A., Iborra, M.P., Lira Garrido, J., Rodríguez González, E., Celestino, S., Olària, C., Arsuaga, J.L., Kotova, N., Pryor, A., Crabtree, P., Zhumatayev, R., Toleubaev, A., Morgunova, N.L., Kuznetsova, T., Lordkipanize, D., Marzullo, M., Prato, O., Bagnasco Gianni, G., Tecchiati, U., Clavel, B., Lepetz, S., Davoudi, H., Mashkour, M., Berezina, N.Y., Stockhammer, P.W., Krause, J., Haak, W., Morales-Muñiz, A., Benecke, N., Hofreiter, M., Ludwig, A., Graphodatsky, A.S., Peters, J., Kiryushin, K.Y., Iderkhangai, T.-O., Bokovenko, N.A., Vasiliev, S.K., Seregin, N.N., Chugunov, K.V., Plasteeva, N.A., Baryshnikov, G.F., Petrova, E., Sablin, M., Ananyevskaya, E., Logvin, A., Shevnina, I., Logvin, V., Kalieva, S., Loman, V., Kukushkin, I., Merz, I., Merz, V., Sakenov, S., Varfolomeyev, V., Usmanova, E., Zaibert, V., Arbuckle, B., Belinskiy, A.B., Kalmykov, A., Reinhold, S., Hansen, S., Yudin, A.I., Vybornov, A.A., Epimakhov, A., Berezina, N.S., Roslyakova, N., Kosintsev, P.A., Kuznetsov, P.F., Anthony, D., Kroonen, G.J., Kristiansen, K., Wincker, P., Outram, A. and Orlando, L., 2021. The origins and spread of domestic horses from the Western Eurasian steppes. *Nature* 598, 634–640. https://doi.org/10.1038/s41586-021-04018-9

Ling, J., Earle, T.K. and Kristiansen, K., 2018. Maritime Mode of Production. Raiding and Trading in Seafaring Chiefdoms'. *Current Anthropology* 59, 488–524. https://doi.org/10.1086/699613

Mann, M., 2012. *The Sources of Social Power. Vol. 1: A History of Power from the Beginning to AD 1760*. Cambridge: Cambridge University Press. https://doi.org/10.1017/CBO9780511570896

Maran, J., 2022. The Nordic Bronze Age and Hittite Anatolia: Deconstructing an Archaeological Myth. *In:* E. Kaiser, M. Meyer, S. Scharl and S. Suhrbier, eds. *Wissenschichten. Festschrift für Wolfram Schier zu seinem 65. Geburtstag*, Internationale Archäologie – Studia honoraria 41. Rahden/Westfalen: Verlag Marie Leidorf, 449–466.

Marx, K. and Engels, F., 1852/1972. *Der achtzehnte Brumaire des Louis Bonaparte*. Werke, Band 8. Berlin: Dietz Verlag, 115–123.

Mittnik, A., Massay, K., Knipper, C., Wittenborn, F., Friedrich, R., Pfrengle, S., Burri, M., Carlichi-Witjes, N., Deeg, H., Furtwängler, A., Harbeck, M., Heyking, K.V., Kociumaka, C., Kucukkalipci, I., Lindauer, S., Metz, S.E., Staskiewicz, A., Thiel, A., Wahl, J., Haak, W., Pernicka, E., Schiffels, S., Stockhammer, P.W. and Krause, J., 2019. Kinship-based social inequality in Bronze Age Europe. *Science* 366, 731–734. https://doi.org/10.1126/science.aax6219

Müller, J., 1994. Zur sozialen Gliederung der Nachbestattungsgemeinschaft vom Magdalenenberg bei Villingen. *Praehistorische Zeitschrift* 69(2), 175–221.

Müller, J. and Vandkilde, H., 2020. The Nordic Bronze Age Rose from Copper Age Diversity: Contrasts in the Cimbrian Peninsula. *In:* K. Austvoll, M.H. Eriksen, P.D. Frederiksen, A.L. Melheim, L. Prosch-Danielsen and L. Skogstrand, eds. *Contrasts of the Nordic Bronze Age: Essays in Honour of Christopher Prescott*. Turnhout: Brepols Publishers, 29–48.

Müller, J. and Windler, A., 2016. Soziale Ungleichheit und die Entwicklung spätneolithischer und chalkolithischer Gesellschaften im westpontischen Raum. *In:* V. Nikolov and W. Schier, eds. *Der Schwarzmeerraum vom Neolithikum bis in die Früheisenzeit (6000–600 v. Chr.): Kulturelle Interferenzen in der Zirkumpontischen Zone und Kontakte mit ihren Nachbargebieten*. Rahden/Westfalen: Verlag Marie Leidorf, 93–108.

Nørgaard, H.W., 2018. *Bronze Age Metalwork. Techniques and traditions in the Nordic Bronze Age 1500–1100 BC*. Oxford: Archaeopress.

Nørgaard, H.W., 2019. Spezialisierung in der Nordischen Bronzezeit (1500–1100 BC): Metallhandwerker, Werkstätten und deren Informationspotenzial zur Organisation des Metallhandwerks während der älteren und mittleren Bronzezeit in Nordeuropa. *In:* G. Woltermann, D. Neumann and R. Gleser, eds. *Spezialisierungen in der Bronzezeit Archäologische Quellen und Modelle. Beiträge der AG Bronzezeit auf der 83. Tagung des Nordwestdeutschen Verbandes für Altertumsforschung e. V. am 18.–21. September 2016 in Münster. Neolithikum und ältere Metallzeiten*, Studien und Materialien 4. Münster: LIT Verlag, 91–113.

Nørgaard, H.W. and Reiter, S., 2020. La Spécialisation à l'âge du Bronze nordique (1500–1100 BC): des métallurgistes, des ateliers et leur apport à l'organisation du travail du bronze à l'âge du Bronze ancien et moyen. *In:* R. Peake, S. Bauvais, C. Hamon and C. Mordant, eds. *La spécialisation des productions et les spécialistes prehistoriques. Specialised productions and specialists in prehistory. Actes de la séance de la Société préhistorique française de Paris 5 juin 2018*, Séances de la Société préhistorique française 16. Paris: Société préhistorique française, 123–145.

Nørgaard, H.W., Pernicka, E. and Vandkilde, H., 2019. On the trail of Scandinavia's early metallurgy: provenance, transfer and mixing. *PLoS ONE* 14(7), e0219574, 1–32. https://doi.org/10.1371/journal.pone.0219574

Nørgaard, H.W., Pernicka, E. and Vandkilde, H., 2021. Shifting Networks and Mixing Metals: Changing metal-trading routes to Scandinavia correlate with Neolithic and Bronze Age transformations. *PLoS ONE* 16, e0252376. https://doi.org/10.1371/journal.pone.0252376

Nørgaard, H.W., Pernicka, E. and Vandkilde, H., 2022. 1600 BC: Fårdrup and Valsømagle-type axes and the first evidence of southern Alpine metal. *Acta Archaeologica* 92(2), 185–226. https://doi.org/10.1163/16000390-20210036

Raffield, B., Greenlow, C., Price, N. and Collard, M., 2016. Ingroup identification, identity fusion and the formation of Viking war bands. *World Archaeology* 48(1), 35–50. https://doi.org/10.1080/00438243.2015.1100548

Rassmann, K., 2011., Metallverbrauch in der frühen Bronzezeit Mitteleuropas. Produktion, Zirkulation und Konsumtion, frühbronzezeitliche Metallobjekte als Untersuchungsgegenstände einer archäologischen Wirtschaftsgeschichte. *In:* S. Hansen and J. Müller, eds. *Sozialarchäologische Perspektiven. Gesellschaftlicher Wandel 5000–1500 v. Chr. zwischen Atlantik und Kaukasus*. Mainz: Philipp von Zabern, 341–363.

Rassmann, C., Christensen, S.T. and Pedersen, V.J., 2015. Pragtøkserne fra Arildskov. Et depotfund fra Bronzealderen. *Midtjyske Fortællinger*, 28–40.

Sahlins, M., 2005. The economics of develop-man in the Pacific. *In:* H. Wardlow and J. Robbins, eds. *The Making of Global and Local Modernities in Melanesia. Humiliation, Transformation and the Nature of Cultural Change*, Anthropology and Cultural History in Asia and the Indo-Pacific Series. New York: Routledge, 23–42.

Simonsen, J., 2017. *Daily life at the turn of the neolithic: a comparative study of longhouses with sunken floors at Resengaard and nine other settlements in the Limfjord region, South Scandinavia*, Jutland Archaeological Society Publications 98. Skive: Museum Salling/Jutland Archaeological Society.

Sparrevohn, L.R., Kastholm, O.T. and Nielsen, P.O., eds., 2019. *Houses for the Living. Two-aisled houses from the Neolithic and Early Bronze Age in Denmark*. Copenhagen: Royal Society of Northern Antiquaries/University Press of Southern Denmark.

Steckel, R.H., 1995. Stature and the Standard of Living. *Journal of Economic Literature* 33(4), 1903–1940. https://www.jstor.org/stable/2729317

Stinson, S., 2012. Growth Variation: Biological and Cultural Factors. *In:* S. Stinson, B. Bogin and D. O´Rourke, eds. *Human Biology: An Evolutionary and Biocultural Perspective*. Hoboken, New Jersey: John Wiley & Sons, Inc., 587–635. https://doi.org/10.1002/9781118108062.ch12

Stock, J.T., Pomeroy, E., Ruff, C.B., Brown, M., Gasperetti, M.A., Li, F.-J., Maher, L., Malone, C., Mushrif-Tripathy, V., Parkinson, E., Rivera, M., Siew, Y.Y., Stefanovic, S., Stoddart, S., Zarica, G. and Wells, J.C.K., 2023. Long-term trends in human body size track regional variation in subsistence transitions and growth acceleration linked to dairying. *Proceedings of the National Academy of Sciences (PNAS)* 120(4), e2209482119. https://doi.org/10.1073/pnas.2209482119

Tornberg, A., 2013. Diet, Health and Agriculture. The Late Neolithic-Early Bronze Age Example of Abbekås, Southern Sweden. *Lund Archaeological Review* 19, 7–18.

Tornberg, A., 2015. A Tale of the Tall – A Short Report on Stature in Late Neolithic-Early Bronze Age Southern Scandinavia. *In:* K. Brink, S. Hydén, K. Jennbert, L. Larsson and D. Olausson, eds. *Neolithic Diversities. Perspectives from a conference in Lund, Sweden*. Lund: Department of Archaeology and Ancient History, 107–114.

Tornberg, A., 2018a. *Health, cattle and ploughs – Bioarchaeological consequences of the Secondary Products Revolution in southern Sweden, 2300–1100 BCE*, Acta Archaeologica Lundensia 71. Lund: Lund University. https://lucris.lub.lu.se/ws/portalfiles/portal/41447945/Anna_T_inkl._omslag.pdf ; last access 18th March 2025

Tornberg, A., 2018b. Stature and the Neolithic transition – Skeletal evidence from southern Sweden. *Journal of Archaeological Science: Reports* 17, 58–67. https://doi.org/10.1016/j.jasrep.2017.10.031

Tornberg, A., 2022. A prehistory of violence: Evidence of violence related skull trauma in southern Sweden, 2300–1100 BCE. *In:* A. Tornberg, A. Svensson and J. Apel, eds. *Life and Afterlife in the Nordic Bronze Age: Proceedings of the 15th Nordic Bronze Age Symposium held in Lund, June 11–15, 2019*, Acta Archaeologica Lundensia 37. Lund: Department of Archaeology and Ancient History, 99–118.

Tornberg, A. and Vandkilde, H., in prep. *The Megalithic Cists with Skeletal Trauma from Gjerrild and Over-Vindinge in Denmark*.

Treherne, P., 1995. The Warrior's Beauty: The Masculine Body and Selv-identity in Bronze Age Europe. *Journal of European Archaeology* 3(1), 105–144. https://doi.org/10.1179/096576695800688269

Van Wees, H., 1992. *Status Warriors. War, Violence and Society in Homer and History*, Dutch Monographs on Ancient History and Archaeology 9. Amsterdam: J.C. Gieben. https://doi.org/10.1163/9789004525559

Vandkilde, H., 1996. *From Stone to Bronze. The Metalwork of the late Neolithic and earliest Bronze Age in Denmark*. Aarhus: Jutland Archaeological Society.

Vandkilde, H., 2006. Warfare and Gender according to Homer: An Archaeology of an Aristocratic Warrior Culture. *In:* T. Otto, H. Thrane and H. Vandkilde, eds. *Warfare and Society. Archaeological and Social Anthropological Perspectives*. Aarhus: Aarhus University Press, 515–528.

Vandkilde, H., 2014. Breakthrough of the Nordic Bronze Age: Transcultural Warriorhood and a Carpathian Crossroad in the Sixteenth Century BC. *European Journal of Archaeology* 14, 602–633. https://doi:10.1179/1461957114Y.0000000064

Vandkilde, H., 2017. *The Metal Hoard from Pile in Scania, Sweden. Place, things, time, metals, and worlds around 2000 BCE*, The Swedish History Museum Studies 29. Stockholm: The Swedish History Museum.

Vandkilde, H., 2018. Body Aesthetics, Fraternity and Warfare in the long European Bronze Age – postscriptum. *In:* C. Horn and K. Kristiansen, eds. *Warfare in Bronze Age Society*. Cambridge: Cambridge University Press, 229–243. https://doi:10.1017/9781316884522.016

Vandkilde, H., 2019. Bronze Age Beginnings – a Scalar View from the Global Outskirts. *Proceedings of the Prehistoric Society* 85, 1–27. https://doi.org/10.1017/ppr.2019.7

Vandkilde, H., 2020. Amber, Weapons and Circulating Ideas about Leadership at the Threshold to the Middle Bronze Age in Europe. *In:* J. Maran, R. Băjenaru, S.-C. Ailincăi, A.-D. Popescu and S. Hansen, eds. *Objects, Ideas and Travelers. Contacts between the Balkans, the Aegean and Western Anatolia during the Bronze and Early Iron Age. Volume to the memory of Alexandru Vulpe Proceedings of the Conference in Tulcea, 10–13 November, 2017*, Universitätsforschungen zur prähistorischen Archäologie 350. Bonn: Habelt, 31–42.

Vandkilde, H., 2022. Entrepreneurs, Metals and Change: Scandinavia meets its Neighbours in the Earliest Bronze Age. *In:* R.J. Chacon, J. Ling and K. Kristiansen, eds. *Trade Before Civilization. Long-distance Exchange and the Rise of Social Complexity*. Cambridge: Cambridge University Press, 309–333. https://doi:10.1017/9781009086547.017

Vandkilde, H., Matta, V., Ahlqvist, L. and Nørgaard, H.W., 2022. Anthropomorphised warlike beings with horned helmets: Bronze Age Scandinavia, Sardinia, and Iberia compared. *Praehistorische Zeitschrift* 97(1), 130–158.

Vandkilde, H., Stephansen, C.F., Suchowska-Ducke, P., Ahlqvist, L., Skaaning Andersen, C., Felding and Nørgaard, H.W., 2024. Metal-for-Amber in the European Bronze Age. *Praehistorische Zeitschrift* 99(1), 280–338.

Wells, J.C.K., 2007. Sexual dimorphism of body composition. *Best Practice & Research Clinical Endocrinology & Metabolism* 21(3), 415–430. https://doi.org/10.1016/j.beem.2007.04.007

CHAPTER 4

Construction of Social Roles

Figure chapter 4: Oldenburg-Dannau LA 77 in Ostholstein, Germany. Reconstruction of village life in the Funnel Beaker settlement from the period between c. *3270–2920 BCE, Germany (Drawing: Susanne Beyer; graphic: Petra Horstmann).*

Bell Beakers and Their Decorative Motifs – A Reflection of Social Network Sizes?

Ralph Großmann-Klabunde

KEYWORDS: *bell beaker, networks, decorative motifs, similarity network analysis, Middle Elbe-Saale*

Abstract

In the archaeological literature, the bell beaker vessel of the eponymous phenomenon is usually regarded as a ritually and ideologically charged grave offering, and is associated with regional typological and chronological questions. In comparison, this study focuses on the bell beaker as a possible medium of social networks. The aim of the investigation is to take a closer look at the decoration and motif variations of beakers from the Middle Elbe-Saale region and to trace their meanings within a social network.

In this article, a network analysis based on a similarity index of the ceramic decoration patterns is carried out in order to determine the presumed relationships between the bell beakers documented so far and their owners. This similarity network analysis enables us to identify potential relationships between different burials. Furthermore, the hypothesis is put forward as to what extent the variety and number of bell beaker motifs reflects the social position of the bell beaker bearers.

Initial results show that bearers of bell beakers with a high betweenness centrality measure have a regional focus (close to the Saale River) and occupy a strategic position in the dissemination of information. Furthermore, initial results show that beakers with a high variation of motifs were associated with a higher number of grave goods and are presumably linked to people who were part of a large social network.

Zusammenfassung

Der Glockenbecher des gleichnamigen Phänomens wird in der archäologischen Fachliteratur meist als rituell und ideologisch aufgeladene Grabbeigabe betrachtet und mit regionaltypologischen und chronologischen Fragestellungen in Verbindung gebracht. Der Glockenbecher als mögliches Medium sozialer Netzwerke steht dagegen im Mittelpunkt dieser Studie. Ziel der Untersuchung ist es, die Dekorations- und Motivvariationen der Becher aus dem Mittelelbe-Saale-Raum näher zu beleuchten und ihre Bedeutung innerhalb eines sozialen Netzwerkes zu verfolgen.

Dazu wird eine Netzwerkanalyse auf der Basis eines Ähnlichkeitsindexes keramischer Dekormuster durchgeführt, um mutmaßliche Beziehungen zwischen den bisher dokumentierten Glockenbechern und ihren Besitzern zu ermitteln. Diese Ähnlichkeits-Netzwerkanalyse ermöglichte es uns, potentielle Beziehungen zwischen verschiedenen Bestattungen zu identifizieren. Darüber hinaus wird die Hypothese aufgestellt, inwieweit die Vielfalt und Anzahl der Motive auf den Glockenbechern die soziale Stellung der Glockenbecherträger widerspiegelt.

Erste Ergebnisse zeigen, dass die Träger von Glockenbechern mit einem hohen Maß an Zwischenzentralität einen regionalen Schwerpunkt (in der Nähe der Saale) haben und eine strategische Position bei der Verbreitung von Informationen einnehmen. Darüber hinaus zeigen erste Ergebnisse, dass Becher mit einer hohen Variation an Motiven mit einer höheren Anzahl an Grabbeigaben assoziiert sind und wahrscheinlich mit Personen in Verbindung stehen, die Teil eines größeren sozialen Netzwerkes waren.

BELL BEAKERS – MEDIA OF SOCIAL NETWORKS

The starting point of this study is my dissertation from 2016 (Großmann 2016). I wrote it under the valuable supervision of Johannes Müller, with whom I not only share a fondness for third-millennium beakers and the German football club Holstein Kiel, but who also introduced me to the methods of multivariate statistics. In addition to the Corded Ware, the Bell Beaker phenomenon, both groups of the 3rd millennium BCE, was a major topic of this thesis. This study continues the work of the dissertation and focuses entirely on the Beaker type of the Bell Beaker Phenomenon.

The Bell Beaker vessel has long been associated with the rise of elites and more generally with the image of the archer-metallurgist consuming alcoholic beverages (Sherratt 1987; Strahm 2004; Garrido Pena 2007; Vander Linden 2007; Lemercier 2011; Salanova, 2016). Furthermore, David Leonard Clarke sees an analogy between the symbolism of the textile motifs on the engraved stelae and those of the pottery (Clarke 1976).

Since the material style of the pottery is obviously one of the most important archaeological means of gaining access to the interactions between people, some authors have proposed different theories on the distribution of the bell beaker. Thus, Alain Gallay (1979) proposed the existence of five major "networks" of exchange through which specific elements of the bell beaker were disseminated as "prestige goods" from the different areas of bell beaker culture in Europe. In 2015, Marie Besse considered the bell beaker as a 'mosaic of networks' and argued that the bell beaker vessel in particular was the link that facilitated the networks of dissemination of the other artifacts of the bell beaker 'set' (Besse 2015). These various networks may refer to direct contacts between individuals, the exchange of goods, the dissemination of an aesthetic scheme, or other mechanisms that are difficult to assess without texts or direct observations (Salanova 2000; Strahm 2004; Vander Linden 2004; 2007; Heyd 2007).

In general, many publications equate ceramic motifs with symbols that have extrinsic and intrinsic meanings that are no longer accessible to us today. It is possible that these symbols create identity for members of a group and at the same time have an exclusionary effect on outsiders (Assmann and Friese 1998). It cannot be excluded that ornamental motifs represent a particular hierarchical or heterarchical group within a society (DeMarrais *et al.* 1996, 16). They are instruments of communication (Wobst 1977) that convey and transmit information and meaning to their viewers. It is important to note that ceramic motifs are always related to other motifs and can only be understood through them (Burmeister 2003; Hodder 1982). Their meanings are also subject to constant change. Alternatively, motifs may have had no greater meaning, or their meanings may have been lost and passed down through tradition.

To emphasise a network of social relations and cultural expressions, the theoretical approaches of Wenger's communities of practice and Anselm Strauss's social worlds are appropriate (Wenger 1998; Strauss 1993). Both concepts emphasise the formation of social groups through collaborative practices related to specific tasks or commitments, and both point to the fact that human individuals are usually part of several such groups that intersect in different ways (cf. Furholt 2020). Networks are made up of individuals who are connected through their participation in a social group. Communities are formed through the interaction of people and the sharing of knowledge and materials, including networks that include religious practices (Caraglio 2020).

Therefore, ceramic decorations — as a material style — testify to social connections rather than culturally separate groups (Dietler and Herbich 1994), as they are one of the good testimonies of co-socialisation, mechanisms of learning or transfer of knowledge and shared skills, in other words, "communities of practice" (Wenger 1998).

This study elaborates on a network based on bell beaker decoration styles. Other networks based on other attributes of the social world, such as burial, settlement, or economic data, would reveal network structures that may be similar or different. The clustering of networks based on different attributes results in a polythetic classification. Such a polythetic model can provide a differentiated and dynamic, yet more comprehensible representation of past social reality and reflect the intricate patterns of social reality (Furholt 2020).

The goal of this paper is to examine bell beaker motifs and their possible meaning for the community. Can we establish relationships between the decorations and the buried individuals using ceramic similarity indices and network representations?

Considering the archaeological context in the Middle Elbe-Saale area, we can identify several sub-objectives. They can be formulated as follows

- Can spatial differences in networks be identified from decorations?
- Can the decoration practices tell us about the strength of interactions between different burials?
- Are the variations in decoration and the number of motifs related to social status?

For further studies, it would also be interesting to analyze whether some decorations are related to the age, gender, genetic ancestry, *etc.* of the wearers.

To answer these questions, we performed a similarity network analysis or a unimodal network analysis based on the Jaccard similarity index. The degree of similarity between the decorations on the beakers could help to highlight specific individuals who were involved in the spread of certain decoration patterns. Using network analysis, we can visualise these interactions between burial sites and gain a better understanding of the social context.

With this approach we want to show the presumed strength of the relationships between the sites. Finally, the aim is to determine specific social structures by identifying phenomena of cohesion, equivalence, hierarchical importance, autonomy or even competition between the different social actors (Caraglio 2020; Burt 1991).

SIMILARITY NETWORK ANALYZES

The bell beakers from the Middle Elbe-Saale region are well suited for a case study to test a similarity network analysis method as defined and applied for archaeological contexts in other studies (Prignano *et al.* 2014). The investigated vessels belong to the comparatively numerous bell beaker burials from the Middle Elbe-Saale region. A total of 220 vessels, mostly bell beakers, but also footed bowls with analogous decoration, from 161 graves were analyzed. Most of the data come from the database of the dissertation published in 2016 (Großmann 2016), which can be found on the website of the Johanna-Mestorf-Academy *https://www.jma.uni-kiel.de/en/research-projects/data-exchange-platform* and has since been supplemented by further burials.

This is a first analytical attempt based on decorated bell beaker ceramics for the Middle-Elbe-Saale region. Each beaker is described on the basis of 64 possible decoration variables. These decoration variables were recorded independently of the decoration technique. Of course, the following analysis must consider that there were also chronological differences (cf. Großmann, 2016) between the beakers that cannot be discussed in detail here.

The different characteristics were collected in a simple binary table to calculate a Jaccard similarity index between the beakers (cf. Caraglio 2020). In our case, the nodes represent the bell beakers and the links represent the relationships between the beakers resulting from the common presence of ceramic patterns.

Network analyses based on the similarity index, which are increasingly used in archaeology and cultural anthropology (Brughmans 2013; Mills *et al.* 2013; Bernabeu *et al.* 2014; Birch and Hart 2018), help to visualise the similarity links between assemblages in order to highlight the most similar assemblages. Here, the Jaccard similarity index was used because it is a well-established archaeological measure for estimating similarities between artifact assemblages (Besse 1996; Vaquer and Remicourt 2008; Cauliez 2011; Jiménez-Puerto 2022).

The value of the Jaccard similarity index is computed here using the UCINET software and collected in a similarity matrix, which is then used to establish links between the nodes of the network. For the network, the measurements and subgroupings created are based on links with a Jaccard similarity index higher than 0.4.

The subgroups were then extracted from the whole group using the Girvan-Newman algorithm method. Furthermore, the centrality measures were analyzed, which can have different emphases: In addition to the centrality measure with the highest "degree" and the highest "closeness", it is possible to measure the highest "betweenness" (Baek *et al.* 2021).

In this study, the traditional measure of centrality in network analysis, betweenness centrality, is used first because it shows the "bridges" between potential subnetworks, which fits perfectly with the goals of identifying "ethnic boundaries". This measure is generally used to identify nodes that occupy a strategic place in the dissemination of information. A person with a high betweenness centrality may have a high mediating capacity because more of their friends have to go through them to communicate with each other (*ibid.*). In our study, the spread of "information" is significant, which can be seen through the spread of decoration variation or decoration composition or a certain motif, revealing communities of practice.

Second, we analyzed the "degree" measure, which is the sum of the connections of each node. In a social network, a person's degree centrality, *i.e.*, the number of direct connections (*e.g.* friends) they have, is significant (*ibid.*).

In this study, the author hypothesises that a "privileged position" has a higher centrality value. If a node/individual has a high value, it means that this node/individual is either connected to a high number of other nodes/individuals in terms of pottery decoration (degree) or has a relatively short distance to all other nodes/individuals in the community (betweenness).

Both levels of network analysis could be a way to understand the interactions of a community and reach the sphere of "communities of practice" (Knappett 2011, 98–123).

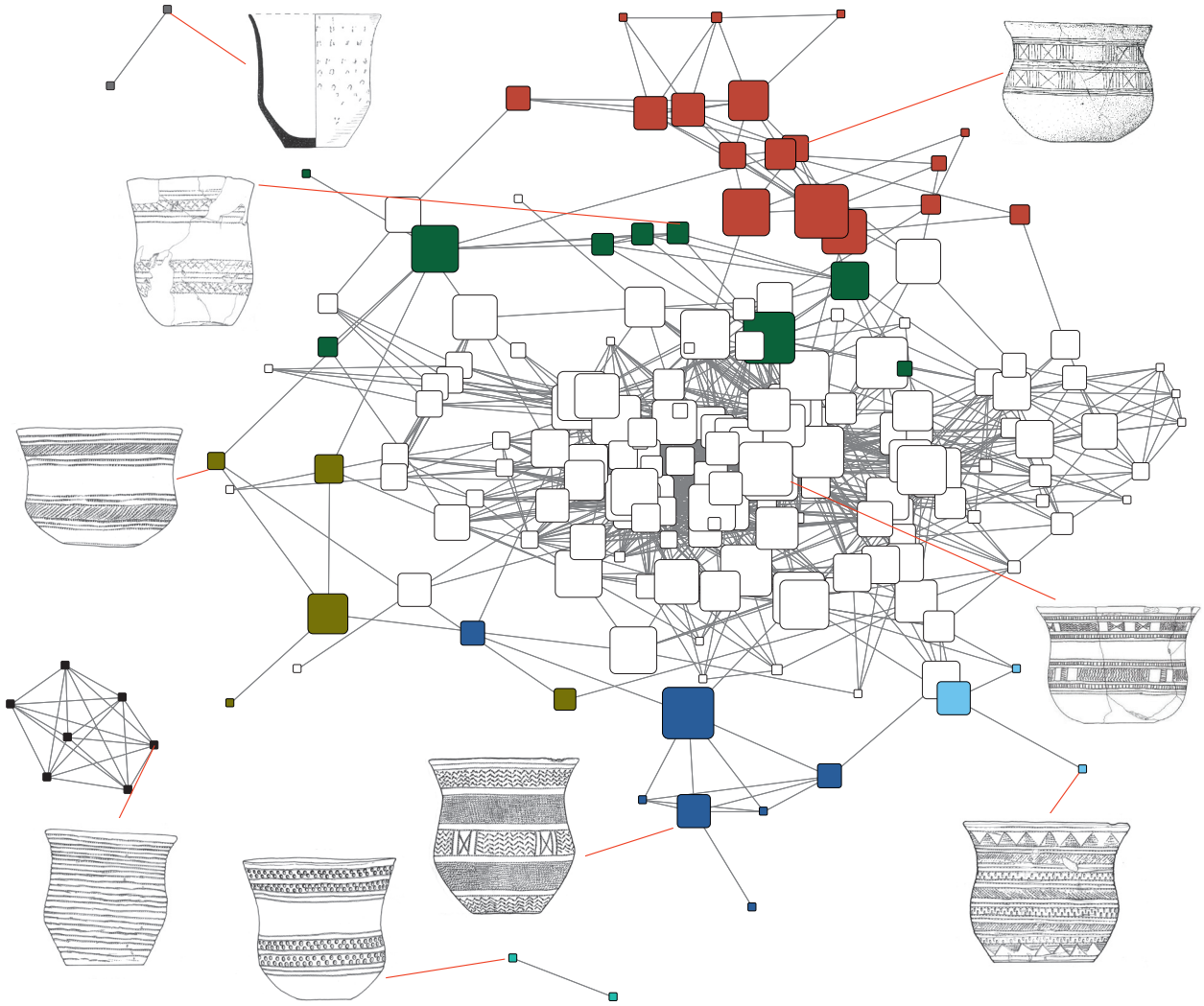

Fig. 1. Network analysis of bell beaker motifs from the Middle Elbe-Saale region based on Jaccard index. Connections based on value of ≥0.4. Subgroups are based on the Girvan-Newman index. Centrality measures of the nodes are based on the betweenness index.

Results of the Similarity Network Analysis

In the following sections, we describe the results and present possible interpretations of the data.

The illustration generated by the Jaccard index (Fig. 1) allows a visual analysis of the data. The result of the similarity analysis shows a total of nine subgroups. For clarity, the strength variations of the connections between the nodes are not shown.

A very large central group of nodes (white) is represented by the Central German metope beakers, which cannot be further grouped (cf. Hille 2012, 54 fig. 3). Just above it is a grouping (green) characterised by a horizontally continuous cross pattern. Further above (red) is a larger group that can be assigned to the "Wetzendorf" group, which is characterised by incised line decoration, cross motifs, and narrow horizontal zigzag-bands (cf. *ibid.*). Overall, this group belongs to a younger group of bell beakers, which foreshadows the decorative features of the Early Bronze Age Únětice group. Below the white group there is a small light blue group characterised by circumferential decoration (horizontal band with diagonal lines, band with interlaced hatching, *etc.*) and belonging to the so-called "Bohemian Bell Beakers". Next to it is a group (dark blue) that also belongs to the "Bohemian Beakers" facies (cf. *ibid.*). These shows, among other things, circumferential line bundle decoration. To the left of the white group is a small group (light brown) with horizontal bands (usually two decoration zones) of diagonal lines.

Off to the side are other groups that are only loosely connected to the main group with links that are not visible in the illustration. These include two beakers (gray, top left of Fig. 1) with multiline imprints/engravings.

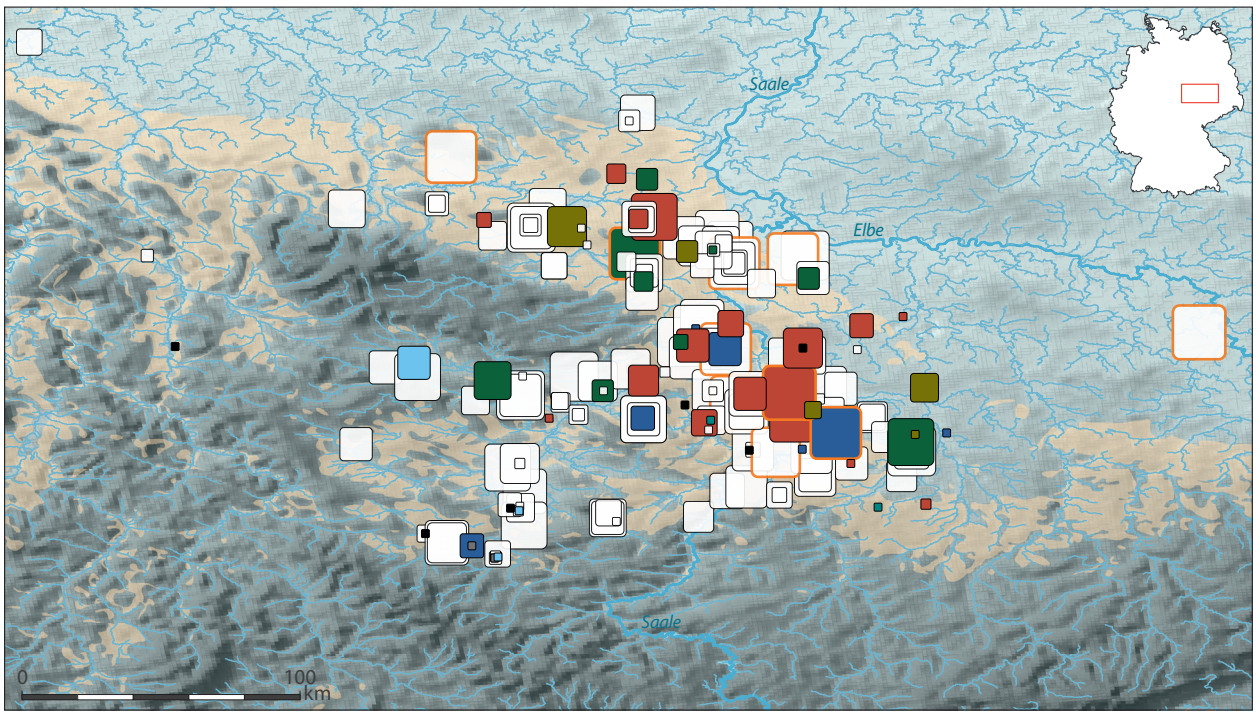

Fig. 2. Distribution of beakers from the Middle Elbe-Saale region in relation to network analyses of beaker motifs from the Middle Elbe-Saale region. Subgroups are based on the Girvan-Newman index. Centrality measures and size of nodes are based on the betweenness index. Orange contour: Nodes with the highest values.

There are also two beakers (turquoise, at the bottom) that show circumferential bands of impressions and lines. Another isolated group (black, bottom left) has only so-called "all over ornamented" beakers. These are beakers completely decorated with circumferential lines (cf. Hille 2012, 54 fig. 3; Großmann 2016).

Overall, the Middle Elbe-Saale region shows a heterogeneous picture of beaker groups, dominated by a large cluster of so-called Central German metope beakers.

Figure 2 and 3 shows the spatial location of the beakers and the spatial location of the highlighted groupings and their connections. At the same time, these figures show the centrality measures "betweenness" on the one hand and "degree" on the other hand.

The following results can be summarised with regard to the distribution (Figs. 2 and 3) of the sub-groupings: The Central German Beakers, by far the largest group, are widespread throughout the Middle Elbe-Saale. The group with the horizontal cross pattern (green) is more widespread in the north; the "Wetzendorf" group (red) is concentrated in the east; the group with mainly narrow, circumferential decorations (light blue) is only widespread in the southwest; the "Bohemian" beakers (dark blue) are located in the south of the distribution, close to Bavaria and Bohemia. Beakers with a diagonal line decoration distributed over two zones (light brown) are mainly found in the northeastern area. The "gray" and "turquoise" groups are found exclusively in the south. The slightly larger group (black) with the AOO beakers is also found only in the southern area.

Regarding the centrality measures, the distribution of the beakers is first considered in terms of the "betweenness" centrality and then in terms of the calculated "degree" centrality. Beakers within the "white", "green", "red" and "dark blue" groups have the highest ten centrality measures. It is noticeable that all of the beakers with the highest "betweenness" centrality tend to be located in the eastern part of the overall distribution (Fig. 2). This is due to their proximity to the river Saale, which may have served as an important communication medium for the network. Assuming that the beakers and their associated motifs are part of a network, the beakers with the highest degree centrality and their carriers are important nodes/bridges between the subgroups.

In terms of the degree centrality measure, the beakers of the white group, which belong to the Middle German two-zone decorated metope beakers, have the highest measure, as expected, since they may have the most connections due to the number of beakers and the range of variation in the decorative motifs. In terms of distribution, there is no clear clustering of the highest category (Fig. 3). Rather, we see an even spatial distribution, with the northern and southeastern peripheries tending to have beakers with a lower degree centrality measure and fewer contacts.

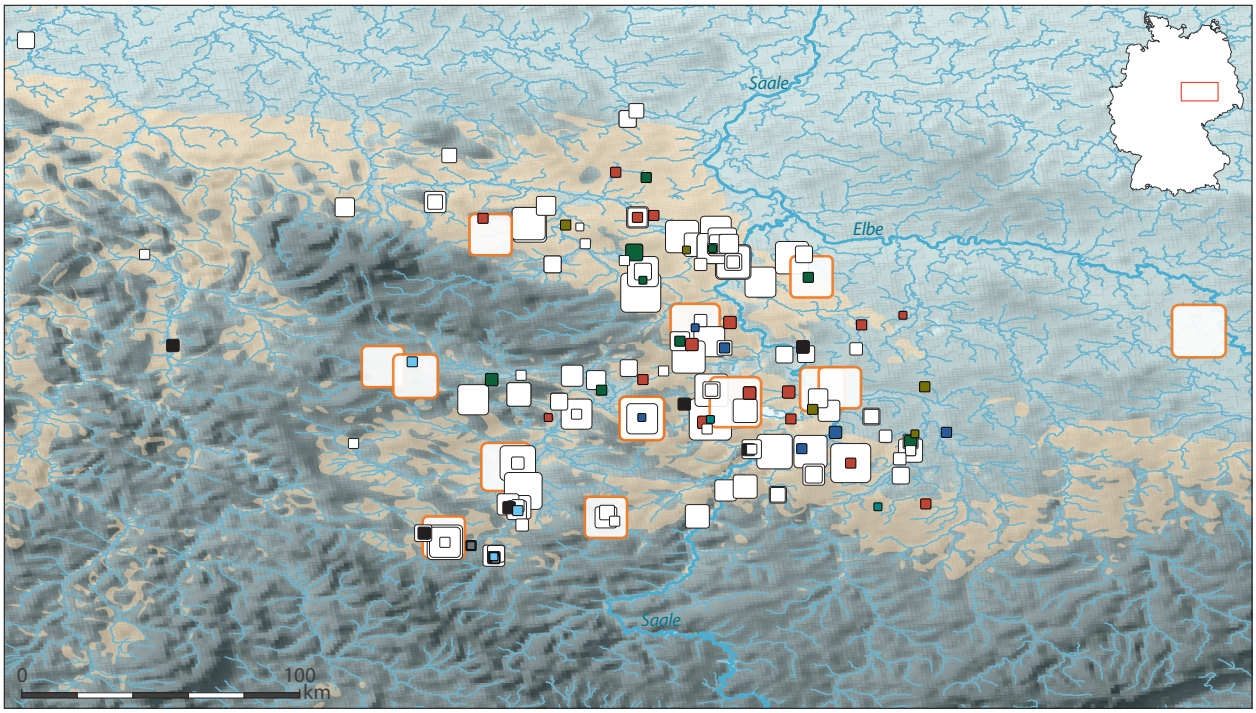

Fig. 3. Distribution of beakers from the Middle Elbe-Saale region in relation to network analysis of bell beaker motifs. Sub-groupings are based on the Girvan-Newman index. Centrality measures and size of nodes are based on the degree index; ***orange contour****: Nodes with the highest values.*

It is striking that both the beaker from the Langeneichstädt burial (Hille 2012, 316 pl. 34.5) and from the Kölsa burial, Delitzsch district (grave 9, Conrad 2007, 104) are represented in the highest category in both the centrality measure "betweenness" and "degree" (Fig. 4). Both the grave from Langeneichstädt and the grave from Kölsa are characterised by above-average grave goods in connection with mature individuals. Due to the orientation of the graves, the burial from Kölsa is a female grave, while the burial from Langeneichstädt is a male grave.

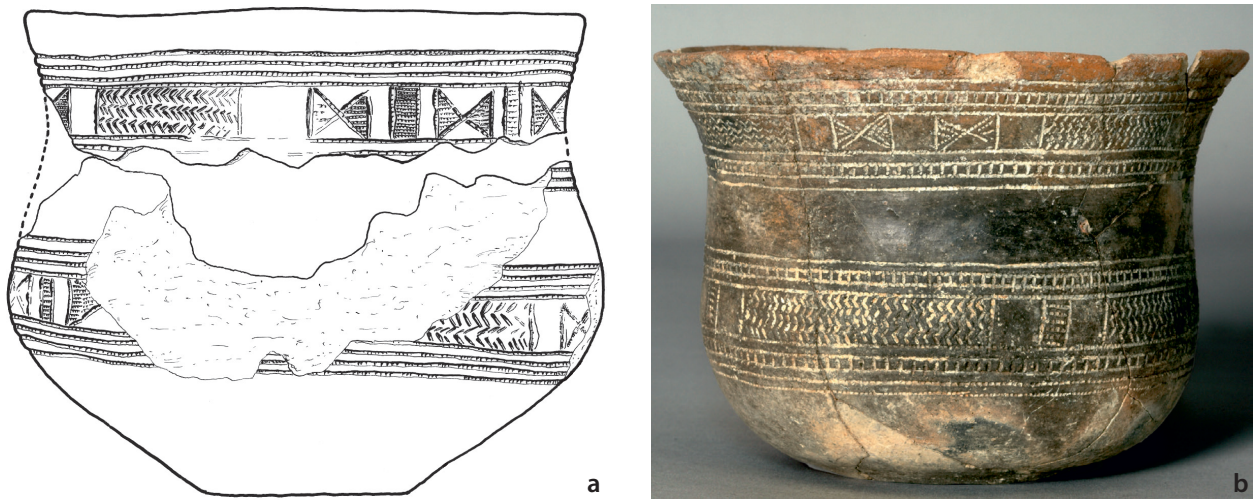

Fig. 4. ***a*** *Beaker from Langeneichstädt (Hille 2012, 316 pl. 34.5) and* ***b*** *Kölsa, Delitzsch district (grave 9, Conrad 2007, 104) with five different motifs. Beaker not in scale.*

COMPARISON OF NUMBER OF DIFFERENT MOTIFS – NUMBER OF GRAVE GOODS

Another question concerns the relationship between the number of different motifs on the beakers and the social status of the buried. This study is based on the hypothesis that the number of different motifs on the beakers reflects the social position of the buried and their position in a network. To test this, the number of grave goods is used as a proxy for the social position of the buried and correlated with the number of beaker motifs. Beakers that were not found in a burial context are not considered. Only burials with a bell beaker are considered.

Figure 5 shows the result of the correlation between the number of motifs category and the average number of grave goods. It can be seen that beakers with no to four different motifs have roughly the same average number of grave goods, with undecorated beakers having the lowest average number of grave goods. It is noticeable that beakers with five different motifs are documented with the highest mean number of grave goods. Burials with five different motifs include, for example, the richly equipped burial 16 from Nohra, district of Nordhausen (Hille 2012, 364 pl. 82.1), the burial from Langeneichstädt (Hille 2012, 316 pl. 34.5; Fig. 4), and burial 1 from Zwenkau (Conrad 2011, 114 fig. 51). Only two vessels have six different motifs and is therefore not considered representative.

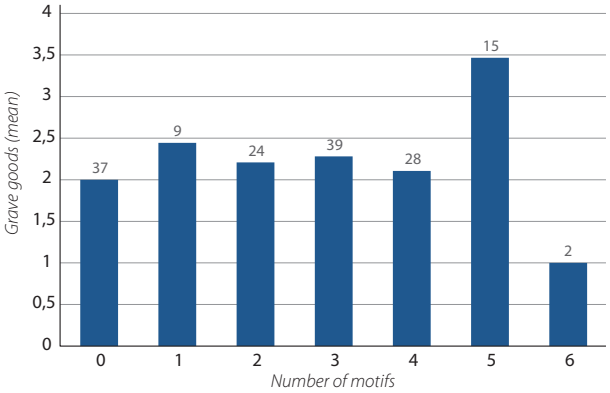

Fig. 5. Correlation of the number of motifs with the average number of grave goods from the Middle Elbe-Saale region. Number above the bars represent number of beakers.

The spatial distribution (Fig. 6) of the beakers shows no conspicuous concentrations in relation to the number of motifs. It is only noticeable that beakers without decoration are concentrated in the south and eastern part of the distribution and beakers with five different motifs are found in the eastern, southern, and northern loess landscapes, possibly in closer proximity to the central basin landscapes and larger river courses.

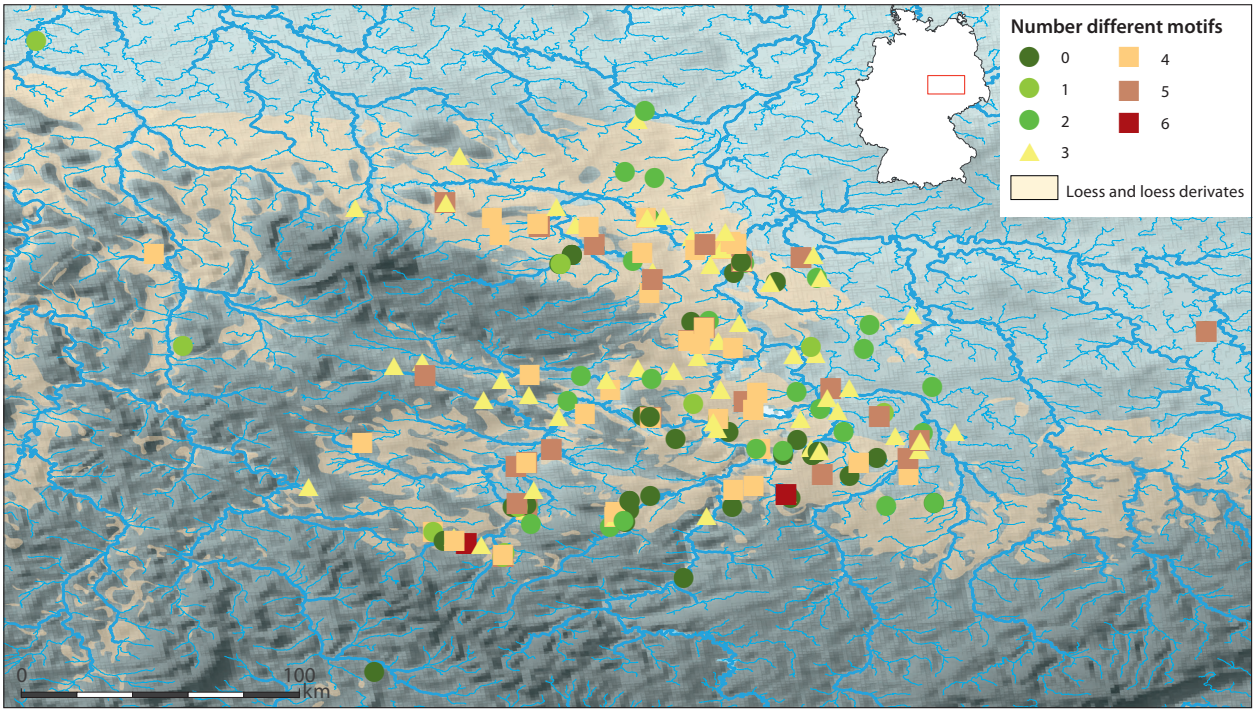

Fig. 6. Spread of Beaker from the Middle-Elbe-Saale region in relation to the number of different Bell Beaker motifs.

DISCUSSION AND CONCLUSION

The results show that network analyses are an effective means of illustrating relationships between archaeological evidence. Clear similarities and differences between the bell beakers within Central Germany can be identified. The analyses revealed networks of bell beakers that consist of sub-groupings of bell beakers for the region.

With regard to the calculation of the "Centrality Measure", revealing results were obtained which show a clear correlation between the beakers with the highest values and the course of the Saale river with regard to the Betweenness centrality measure. The sites with the highest "betweenness" may have played a "hub role" for the spread of the "bell beaker concept", possibly for the spread of know-how and craftsmen, and may have had control over the network.

There are many different reasons why people decorate pots in certain ways. In fact, the establishment of decoration as a material style is the result of a large number of different decisions combined by interconnected and committed social actors (Dietler and Herbich 1994). And the Bell Beaker communities are no exception (Garrido Pena *et al.* 2011; Kohring 2011; Garrido Pena and Herrero-Corral 2015; Dias *et al.* 2017; Fowler 2017). Overall, we can identify a large number of different networks and at the same time less or more strongly networked communities of practice in central Germany.

An initial analysis of the correlation between motif and grave goods quantity shows that the beaker and the motif quality and quantity provide indications of social position. It can be cautiously hypothesised that a high-ranking person among the bell beaker bearers was given a beaker with many different motifs in the grave, representing a large social network and possibly and its owner being more involved in the distribution of knowledge, descendants, influence, exchange of goods, *etc.* At the same time, beakers with few motifs could represent a rather weak participation in a network.

In this context, the decorations on the metope beakers of Central Germany can very well be interpreted as "texts". Decorations as signs alternate with empty spaces (metopes) and thus form a message. The order of the symbols may also play a role (cf. Fig. 4). It is possible that this form of message emerged during an advanced phase of the Bell Beaker phenomenon (cf. Großmann 2016), when the need for "documentation" of social networks (also with the contemporary Corded Ware phenomenon) arose due to the high population growth in Central Germany in the Late Holocene (cf. Großmann *et al.* 2023). We can only speculate why such a "text" is usually added on two bands (cf. Fig. 4). It is possible that the upper and lower lines convey different messages. The hypothesis that the bell beaker and its decoration reflect and represent social relationships is plausible but requires further research.

The initial results also underline that we should be cautious within the interpretations and the reality may be different. The difficulty in interpreting the results based on the use of similarity indices between ceramic and network representations is that they do not always reflect communities of practice. Similarly, the stylistic similarity of artifact types produced by two groups may be low while the actual interaction rate of the group is relatively high and vice versa (Johnson 1977, 481).

Further research, further network analysis in other regions is needed and could provide more data to confirm clearer relationships between different 'communities of practice'. What is clear is that archaeologists generally do not have direct measures of interaction.

However, with the help of network analyses, it seems possible to trace the different paths of the Bell Beaker 'concept' beyond genetic proximity (comp. Furholt, 2020) and to better understand the integration methods of the Bell Beaker in the Middle Elbe-Saale area.

REFERENCES

Assmann, A. and Friese, H., eds., 1998. *Identitäten*, Frankfurt am Main: Suhrkamp.

Baek, E.C., Porter, M.A. and Parkinson, C., 2021. Social network analysis for social neuroscientists. *Social cognitive and affective neuroscience* 16, 883–901.

Bernabeu, A.J., Lozano, P.S. and Pardo Gordó, S., 2014. Iberian Neolithic Networks: The Rise and Fall of the Cardial World. *Frontiers in digital humanities* 4(7). https://doi.org/10.3389/fdigh.2017.00007

Besse, M., 1996. Le Campaniforme en France: Analyse de la céramique d'accompagnement, BAR international Series 635. Oxford: Tempus Reparatum.

Besse, M., 2015. Territorialité, transferts, interculturalités dans les contextes de la diffusion du Campaniforme en Europe. *In:* N. Naudinot, L. Meignen, D. Binder and G. Querré, eds. *Les systèmes de mobilité de la préhistoire au Moyen Âge*. Antibes: Éditions APDCA.

Birch, J. and Hart, J.P., 2018. Social Networks and Northern Iroquoian confederacy dynamics. *American Antiquity* 83, 13–33.

Brughmans, T., 2013. Thinking through networks: A review *of formal network methods in archaeology. Journal of archaeological method and theory* 20, 623–662.

Burmeister, S., 2003. Die Herren der Ringe: Annährung an ein späthallstattzeitliches Statussymbol. *In:* U. Veit, ed. *Spuren und Botschaften*, Tübinger Archäologische Taschenbücher 4. Münster: Waxmann.

Burt, R.S., 1991. *Structure: A general purpose network analysis program providing sociometric indices, cliques, structural and role equivalence, density tables, contagion, autonomy, power and equilibria in multiple network systems*. Beverly Hills: Sage.

Caraglio, A., 2020. How to redraw Bell Beaker networks in Southwestern Europe? *Préhistoires méditerranéennes* 8. https://doi.org/10.4000/pm.2282

Cauliez, J., 2011. Restitution des aires culturelles au Néolithique final dans le sud-est de la France: Dynamiques de formation et d'evolution des styles céramiques. *Gallia préhistoire* 53, 85–202.

Clarke, D.L., 1976. The Beaker Network – Social and economic models. *In: Glockenbecher Symposion, Oberried 17.–23. März 1974*. Bussum: Fibula-van Dishoeck.

Conrad, M., 2007. *Glockenbecherzeitliche Gräber in Nordwestsachsen: Vom Becher(-n) zur Tasse*, Leipziger online-Beiträge zur Ur- und Frühgeschichtlichen Archäologie 25. Leipzig: Professur für Ur- und Frühgeschichte der Universität Leipzig. https://www.gkr.uni-leipzig.de/fileadmin/Fakult%C3%A4t_GKR/Historisches_Seminar/Ur-_und_Fr%C3%BChgeschichte/Leipziger_online-Beitr%C3%A4ge/OnlBei25_1_.pdf ; last access 19th March 2025

Conrad, M., 2011. Glockenbecherzeitliche Gräber in Nordwestsachsen. *Arbeits- und Forschungsberichte – Archäologie in Sachsen* 2009/2010, 39–130.

DeMarrais, E., Castillo Butters, L.J. and Earle, T., 1996. Ideology, materialization, and power strategies. *Current anthropology* 37(1), 15–31.

Dias, M.I., Prudêncio, M.I. and Valera, A.C., 2017. Provenance and circulation of Bell Beakers from Western European societies of the 3rd millennium BC: The contribution of clays and pottery analyses. *Applied Clay Science* 146, 334–342.

Dietler, M. and Herbich, I., 1994. Habitus et reproduction sociales des techniques. *In:* B. Latour and P. Lemonnier, eds. *De la préhistoire aux missiles balistiques*. Paris: La Découverte.

Fowler, C., 2017. Relational Typologies, Assemblage Theory and Early Bronze Age Burials. *Cambridge Archaeological Journal* 27, 95–109.

Furholt, M., 2020. Social Worlds and Communities of Practice: a polythetic culture model for 3rd millennium BC Europe in the light of current migration debates. *Préhistoires méditerranéennes* 8. https://doi.org/10.4000/pm.2383

Gallay, A., 1979. Le phénomène campaniforme: Une nouvelle hypothèse historique. *Archives suisses d'Anthropologie générale* 43, 231–258.

Garrido Pena, R., 2007. El fenómeno campaniforme: un siglo de debates sobre un enigma sin resolver, *in:* Acercándonos al pasado. *In:* C. Cacho, R. Maicas, M.I. Martínez and J.A. Martos, eds. *Acercándonos al pasado: Prehistoria en 4 actos, Museo Arqueológico Nacional*. Madrid: Museo Arqueológico Nacional. Ministerio de Cultura, 1–16

Garrido Pena, R. and Herrero-Corral, A.M., 2015. Children as Potters: Apprenticeship Patterns from Bell Beaker Pottery of Copper Age Inner Iberia (Spain) (*c.* 2500–2000 cal BC). *In:* M. Sánchez Romero, E. Alarcón García and G. Aranda Jiménez, eds. *Children, spaces and identity*. Oxford: Oxbow Books, 40–58.

Garrido-Pena, R., Rojo-Guerra, M.A., García-Martínez De Lagrán, I. and Tejedor-Rodríguez, C., 2011. Drinking and eating together: the social and symbolic context of commensality rituals in the Bell Beakers of the interior of Iberia (2500–2000 cal BC). *In:* G. Aranda Jiménez, S. Montón-Subías and M. Sánchez Romero, eds. *Guess who's coming to dinner*. Oxford: Oxbow Books, 109–129.

Großmann, R., 2016. *Das dialektische Verhältnis von Schnurkeramik und Glockenbecher zwischen Rhein und Saale*, Human development in landscapes 8. Bonn: Habelt.

Großmann, R., Weinelt, M. and Müller, J., 2023. Demographic dynamics between 5500 and 3500 calBP (3550–1550 BCE) in selected study regions of Central Europe and the role of regional climate influences. *PLoS ONE* 18, e0291956.

Heyd, V., 2007. Families, prestige goods, warriors & complex societies: Beaker groups of the 3rd millennium cal BC along the upper and middle Danube. *Proceedings of the Prehistoric Society* 73, 327–397.

Hille, A., 2012. *Die Glockenbecherkultur in Mitteldeutschland*, Veröffentlichungen des Landesamtes für Denkmalpflege und Archäologie Sachsen-Anhalt – Landesmuseum für Vorgeschichte 66. Halle (Saale): Landesamt für Denkmalpflege und Archäologie Landesmuseum für Vorgeschichte.

Hodder, I., ed., 1982. *Symbolic and structural archaeology*, Cambridge: Cambridge University Press.

Jiménez-Puerto, J.R., 2022. *Conectando con el pasado. Redes sociales en la Prehistoria Reciente*. PhD thesis. València: Universitat de València.

Johnson, G.A., 1977. Aspects of regional analysis in archaeology. *Annual Review of Anthropology* 6, 479–508.

Knappett, C., 2011. An archaeology of interaction: Network perspectives on material culture and society. Oxford: Oxford University Press.

Kohring, S., 2011. Social Complexity as a Multi-Scalar Concept: Pottery Technologies, 'Communities of Practice' and the Bell Beaker Phenomenon. *Norwegian Archaeological Review* 44, 145–163.

Lemercier, O., 2011. Le guerrier dans l'Europe du 3e millénaire av. n. è. L'arc et le poignard dans les sépultures individuelles campaniformes. *In:* L. Baray, M. Honegger and M.-H. Dias-Meirinho, eds. *L'armement et l'image du guerrier dans les sociétés anciennes*. Dijon: Éditions universitaires de Dijon, 121–165.

Mills, B.J., Roberts Jr., J.M., Clark, J.J., Haas Jr., W.R., Huntley, D., Peeples, M.A., Borck, L., Ryan, S.C., Trowbridge, M. and Breiger, R.L., 2013. The Dynamics of Social Networks in the Late Prehispanic U.S. Southwest. *In:* C. Knappett, ed. *Network analysis in archaeology*. Oxford: Oxford University Press, 181–202.

Prignano, L., Morer, I. and Diaz Guilera, A., 2014. Wiring the Past: A Network Science Perspective on the Challenge of Archeological Similarity Networks. *Frontiers in digital humanities* 4. https://doi.org/10.3389/fdigh.2017.00013

Salanova, L., 2000. *La question du campaniforme en France et dans les îles anglo-normandes: Productions, chronologie et rôles d'un standard céramique*. Paris: Comité des travaux historiques et scientifiques.

Salanova, L., 2016. Behind the warriors: Bell Beakers and identities in Atlantic Europe (3rd millennium BC). *In:* J.T. Koch and B.W. Cunliffe, eds. *Celtic from the West 3*. Oxford: Oxbow Books.

Sherratt, A., 1987. "Cups that cheered". *In:* W.H. Waldren and R.C. Kennard, eds. *Bell-Beakers of the West Mediterranean*, British Archaeological Reports (BAR), International Series 331. Oxford: Tempus Reparatum.

Strahm, C., 2004. Le phénomène campaniforme et les composantes autochtones non campaniformes. Bulletin de la Société Préhistorique Française, 2 "Substrats et genèse(s) du Campaniforme: actes de la séance de la SPF du 21 février 2003" 101, 201–206.

Strauss, A.L., 1993. *Continual permutations of action*. New York: de Gruyter.

Vander Linden, M., 2007. What linked the Bell Beakers in third millennium BC Europe? *Antiquity* 81, 343–352.

Vander Linden, M., 2004. Polythetic networks, coherent people: A new historical hypothesis for the Bell beaker phenomenon. *In:* J. Czebreszuk, ed. *Similar but different. Bell Beakes in Europe*. Poznań: Adam Mickiewicz University, 35–62.

Vaquer, J. and Remicourt, M., 2008. La série céramique du Bronze ancien 1 au Roc d'en Gabit, Carcassonne (Aude). *Bulletin de la Société Préhistorique Française* 105(3), 501–516.

Wenger, E., 1998. *Communities of practice: Learning, meaning, and identity*. Cambridge: Cambridge University Press.

Wobst, H., 1977. Stylistic behavior and information exchange. *In:* J.B. Griffin and C.E. Cleland, eds. *For the director*. Ann Arbor: Museum of Anthropology, University of Michigan.

Early Male Burials from Nižná Myšľa
On Wild Boars, Arrowheads, and Chronology

Mateusz Jaeger

KEYWORDS: *Early Bronze Age, Slovakia, male burials, hunting, social status*

Abstract

Nižná Myšľa is the largest archaeologically identified cemetery of the Otomani-Füzesabony culture across its entire area of occurrence. Its distinguishing feature is not only the large number of burials but, above all, the specific layout of the cemetery, where graves were arranged in rows. Each row was created independently and maintained chronological order. Starting from the west and moving eastward, successive, increasingly younger burials were placed. Based on available information, the estimated length of cemetery use is approximately 250 years. During this time, the grave goods underwent significant changes.

This text focuses on presenting the burial practices during the earliest phase of the cemetery's use, dated to approximately 1865–1740 BCE, with particular attention to male burials containing objects that suggest a strong connection of the deceased with hunting, including obsidian arrowheads. Throughout the cemetery's history, burial practices emphasised gender differences rooted in the Late Neolithic tradition of the Corded Ware culture.

In phase Bronze Age A1, the grave goods of male burials typically included ceramic vessels and simple objects made from local materials, such as bone, antler, and obsidian, as well as small bronze ornaments. However, the most commonly represented items in male burials were bone awls, wild boar tusks, and pendants made from these tusks. This suggests that hunting wild boar — a particularly dangerous and formidable animal — was a significant aspect (stage? initiation?) in shaping male identity as warriors and hunters.

Zusammenfassung

Nižná Myšľa ist das größte bekannte und archäologisch untersuchte Gräberfeld der Otomani-Füzesabony-Kultur in ihrem gesamten Verbreitungsgebiet. Charakteristisch sind nicht nur die große Anzahl von Bestattungen, sondern vor allem die spezifische Anordnung der Gräber in Reihen. Jede Reihe wurde unabhängig angelegt und folgte einer chronologischen Ordnung, wobei die Bestattungen von Westen nach Osten immer jüngeren Gräbern Platz machten. Nach den verfügbaren Informationen wird die Nutzungsdauer des Gräberfelds auf ca. 250 Jahre geschätzt. Während dieser Zeit veränderte sich die Ausstattung der Gräber erheblich. Der vorliegende Beitrag konzentriert sich auf die Darstellung des Bestattungsrituals in der ältesten Nutzungsphase des Gräberfelds, die auf ca. 1865–1740 v. Chr. datiert, mit besonderem Augenmerk auf Männerbestattungen, deren Beigabenausstattung, auf eine enge Verbindung der Verstorbenen zur Jagd hinweisen, darunter Pfeilspitzen aus Obsidian.

Während der gesamten Nutzungszeit des Gräberfelds betonte das Bestattungsritual Geschlechterunterschiede, die in den Traditionen der spätneolithischen Schnurkeramikkultur verwurzelt waren. In der Phase Bz A1 umfasste die Ausstattung von Männergräbern typischerweise Keramikgefäße und einfache Gegenstände aus lokalen Materialien wie Knochen, Geweih und Obsidian sowie kleine Bronzeornamente. Die am häufigsten vertretenen Grabbeigaben in Männergräbern waren jedoch Knochenspeere, Wildschweinhauer und daraus hergestellte Anhänger. Dies deutet darauf hin, dass die Jagd auf Wildschweine — besonders gefährliche und herausfordernde Tiere — ein wesentlicher Bestandteil (Initiationsritus?) der Bildung der männlichen Identität als Krieger und Jäger war.

Abstrakt

Nižná Myšľa to największe znane i rozpoznane archeologicznie cmentarzysko kultury na całym obszarze jej występowania. Jego charakterystyczną cechą jest nie tylko duża ilość pochówków, ale przede wszystkim specyficzny układ cmentarzyska, w którym groby lokowano w rzędach. Każdy z rzędów tworzony był niezależnie i zachowywał porządek chronologiczny. Poczynając od zachodu, w kierunku wschodnim lokowano kolejne, coraz to młodsze pochówki. W świetle dostępnych informacji okres użytkowania cmentarzyska określić można na ok. 250 lat. W tym czasie wyposażenie grobów ulegało istotnym przemianom. Tekst skupia się na przedstawieniu obrządku pogrzebowego w najstarszej fazie użytkowania cmentarzyska przypadającej na lata ok. 1865–1740 BCE, ze szczególnym uwzględnieniem pochówków męskich wyposażonych w przedmioty sugerujące ścisłą relację zmarłych z polowaniem, w tym w obsydianowe grociki strzał. W całej historii funkcjonowania cmentarzyska obrządek pogrzebowy podkreślał różnice między płciami, zakorzenione w późnoneolitycznej tradycji kultury ceramiki sznurowej. W fazie A1 wyposażenie pochówków męskich zazwyczaj obejmowało naczynia ceramiczne i proste przedmioty wykonane z lokalnych materiałów, takich jak kość, poroże i obsydian, a także drobne ozdoby z brązu. Do najliczniej reprezentowanych elementów wyposażenia pochówków męskich zaliczały się jednak kościane szydła, kły dzika i wykonane z nich zawieszki. Sugeruje to, że właśnie polowanie na dziki — szczególnie niebezpieczne i groźne zwierzę — było istotnym elementem (etapem? inicjacją?) kształtowania męskiej tożsamości jako wojowników i myśliwych.

INTRODUCTION

Nižná Myšľa is the largest known cemetery of the Early Bronze Age Otomani-Füzesabony culture, which was widespread over a vast area covering regions of present-day Slovakia, Hungary, Romania, Poland and Ukraine (Fischl and Kienlin 2019). Its influences also extended beyond, manifested in imported goods as well as stylistic patterns in pottery and metalworking (Makarowicz 1999; Jaeger 2010). A characteristic feature of the Otomani-Füzesabony communities was the construction of long-lasting fortified settlements (Jaeger 2016; Gogâltan 2017).

The cemetery in Nižná Myšľa, located in the eastern part of Slovakia (Košice Basin), is unique on a European scale for the Bronze Age (Fig. 1). It is part of a larger archaeological site, which also includes the remains of two fortified settlements: the earlier settlement, whose inhabitants buried their deceased in the cemetery of interest, and the later one, whose burial area has not yet been discovered (Olexa 2003; Fischl and Olexa 2019). Preliminary research on the absolute chronology of the cemetery suggests that it spanned approximately 250 years (Jaeger *et al.* 2023a), showing significant differences in the way the burials were furnished between Bronze Age A1 and A2 phases (Jaeger *et al.* 2021; 2023a). Its most specific and unique feature, alongside the size and number of burials, is the construction of the funeral space. Burials in the cemetery were arranged in row layout, rare in the European Bronze Age (Fig. 2).

OTOMANI-FÜZESABONY IN SLOVAKIA

The sites of the Otomani-Füzesabony culture, spanning across several contemporary countries, have given rise to numerous regional research traditions and typochronological schemes (Bader 1998; Fischl and Kienlin 2019). In the case of present-day Slovakia, research on the Otomani-Füzesabony culture has a long, well-documented, and specific history. The pivotal period was the 1970s when excavations of fortified settlements were conducted with particular intensity (Jaeger 2016 with further reading). As a result, Otomani-Füzesabony communities began to be perceived as strongly influenced by the Aegean-Anatolian zone (Vladár 1973). These perspectives minimally considered information from burials studies, which were not conducted with the same intensity as those of fortified settlements. During this time, information obtained behind the Iron Curtain, in former Czechoslovakia, started to be incorporated into broader European discussions on connections linking distant parts of Europe, primarily the Mycenaean culture and the Carpathian Basin. A specific image was created of the Early Bronze Age societies in Slovakia as clearly hierarchised structures, led by warrior male elites inhabiting fortified settlements reflecting urbanisation processes in the Mediterranean Basin (Jaeger 2017). This perspective was solidified based on influential Bronze Age syntheses (Sherratt 1994; Kristiansen and Larsson 2005; Vandkilde 2014).

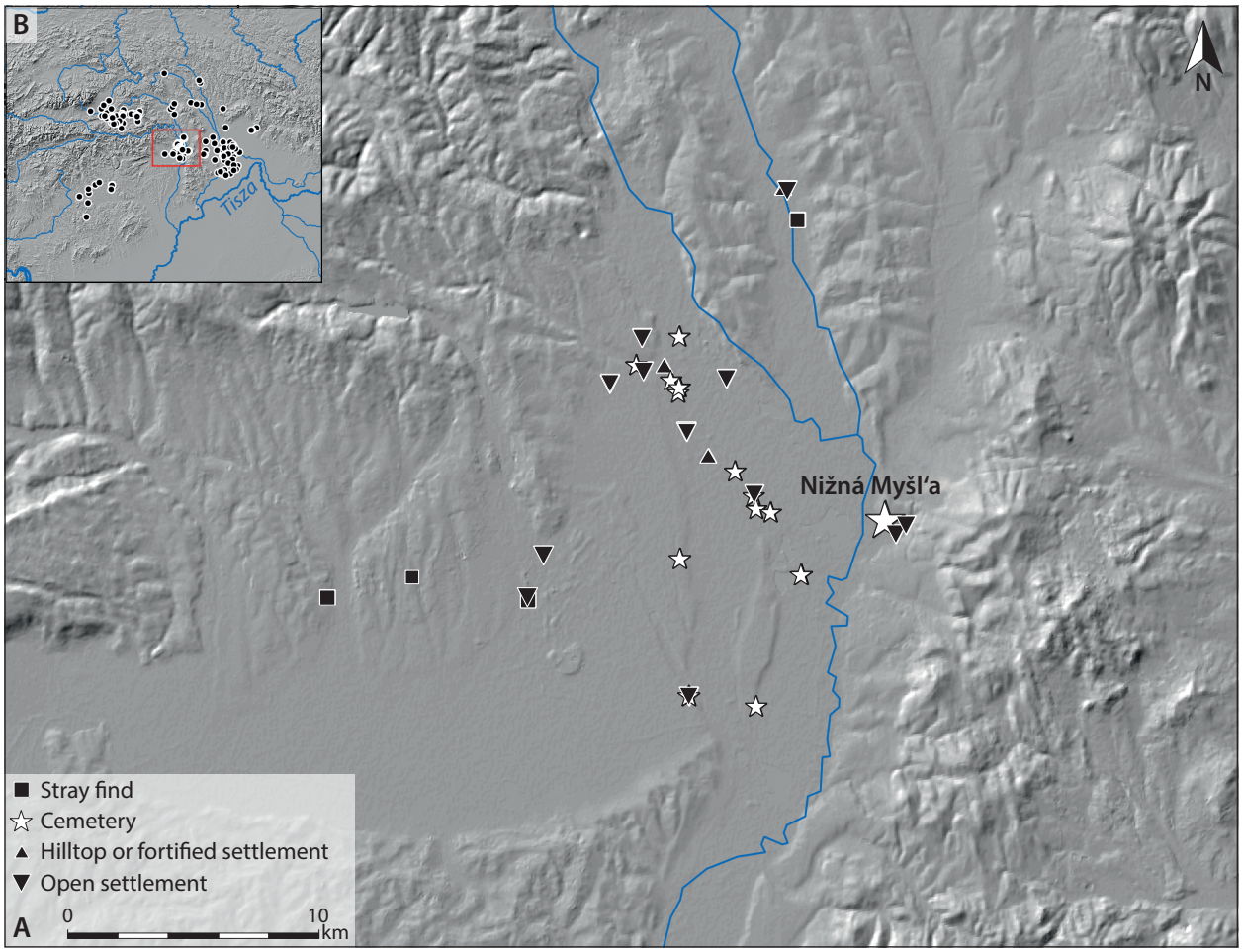

Fig. 1. ***A*** *Distribution of Otomani-Füzesabony Culture sites in the area of the Košice Basin;* ***B*** *general distribution of Otomani-Füzesabony Culture sites in the territory of present-day Slovakia (after Jaeger* et al. *2021).*

However, this perceived model of the Otomani-Füzesabony culture and, more broadly, the Carpathian Basin, did not address significant chronological differences between the compared cultural phenomena (Jaeger 2014; Kienlin 2015). It effectively excluded the possibility of independent development and local sources of prosperity for local communities in the Early Bronze Age. Comprehensive data from cemetery studies, including Nižná Myšľa, were ignored, focusing selectively on examples of uniquely richly equipped burials. Attention was given to the most spectacular settlement finds, hoards of bronze weapons, and general information presented mostly in German and English literature (cf. remarks Jaeger 2014; 2016; 2017). Otomani-Füzesabony communities as "warriors and traders" (Sherratt 1987) became ideal candidates in European Bronze Age archaeology to play the role of intermediaries connecting southern and northern ends of Europe (Vandkilde 2014). Although these communities can indeed be perceived as active participants in the exchange and contacts between various regions of Bronze Age Europe, it is essential to nuance this picture and point out the internal dynamics of such processes. The Otomani-Füzesabony communities did not emerge out of nowhere in a predetermined form and under the influence of external stimuli, rich in bronze and exotic prestige goods. Like many other prehistoric communities, they developed in a specific manner and based on local tradition, in this case deeply rooted in the Late Neolithic/Eneolithic world, both in terms of material culture and specific values.

OTOMANI-FÜZESABONY BURIAL RITE

The burial rite of the Otomani-Füzesabony culture in Slovakia is archaeologically well-documented. Currently, *c.* 35 sites are known, where varying (mostly several) numbers of burials were discovered. The scale of the Nižná Myšľa cemetery is exceptional, not only within Slovak sites, but also across the entire Otomani-Füzesabony occurrence area. Regardless of the size of the discovered cemeteries, certain constant principles governing the funerary rites of Otomani-Füzesabony communities can be observed. The dead were buried in skeleton graves in a flexed position on the side. The orientation of the burials differed according to the sex of the deceased. Men were buried on the right side, aligned on a south-north axis, while women were placed in the graves on the left side, aligned on a north-south axis. The faces of the deceased were directed to the east.

In the extensive area of the Otomani-Füzesabony culture, the presence of cremation burials has also been documented. However, they were relatively less numerous and were associated with the latest stages of the Otomani-Füzesabony culture's development, in areas adjacent to communities practicing cremation as a primary burial ritual (Polla 1960; Olexa 2002).

In addition to pottery, burials were furnished with ornaments made of various materials (boar tusks, animal teeth, bronze, gold, amber, faience), and much more rarely with tools and weapons. In addition to the predominant single burials, examples of double burials are known, either of adults and children, or adults only. A very frequently identified phenomenon was the secondary opening of graves, which escapes unequivocal interpretation. In some cases, such actions were probably motivated by robbery. However, it cannot be excluded that this phenomenon was a part of the funeral rites practiced by the Otomani-Füzesabony communities (Bátora 2000). Currently, we do not have sufficient data which would indicate the existence of separate rules for burying the dead of different ages. In some cases, children's burials were furnished more poorly than those of adults. However, this was not a constant and repeatable rule.

THE NIŽNÁ MYŠĽA CEMETERY AND THE LOCAL BURIAL RITE

Until 2017, a total of 792 funerary features (including cenotaphs) containing the remains of 782 individuals were documented in Nižná Myšľa (Olexa and Nováček 2017). In addition to the dominant single burials, 23 double graves, two graves containing the remains of three deceased and one grave containing the bodies of four people were also discovered. The dead were buried approximately in rectangular graves; in some cases, the remains of wooden coffins were discovered.

According to published information, the cemetery revealed 387 female and 355 male burials (the sex was not identified in all cases). Both sexes were buried following formalised rules, with males positioned on the right side with a S-N axis and females on the left side with a N-S axis (Olexa and Nováček 2013; 2015; 2017).

The most specific and unique feature of the cemetery, alongside the size and number of burials, is the construction of the funeral space. Burials in the cemetery were arranged in rows. The linear arrangement of the graves and the presence of only two cases of superimposed graves from the same period suggest some form of surface marking. Individual rows of burials (and thus the entire cemetery area) had a specific chronological order. The burial of the deceased in individual rows began in the west and continued towards the east. A chronological model based on radiocarbon dating indicates that individual rows were created independently of each other around the same time (Jaeger *et al.* 2023a; Fig. 2). This suggests that individual rows may have served distinct groups (lineages?). Furthermore, burial clusters within individual rows (nuclear families?) were also identified (Jaeger *et al.* 2021).

The cemetery was used for a relatively long period and developed in three chronological phases (Fig. 3):

- Phase BA A1: *c.* 1865–1740 BCE
- Phase BA A1/A2: *c.* 1780–1690 BCE
- Phase BA A2: *c.* 1690–1634 BCE.

Grave gifts varied according to the sex of the deceased and the chronology of the burial. In the early phase of the cemetery (A1), the dead were generally buried with fewer objects. Awls and needles were found in women's graves, while men's graves mainly contained arrowheads made of obsidian, boar tusks and pendants, as well as characteristic plates made of boar tusks that were used as clothing or belt appliqués. The equipment found in burials of both sexes suggests a specific division of social roles and activities related to resource acquisition within the context of hunting (male burials) and the processing of hides and/or furs (female burials). Metal finds were rather rare and appeared mostly in the form of small ornaments. The most numerous metal objects were simple pins of the Rollenkopf I type (Jaeger *et al.* 2021; 2023a). In earlier burials (A1), ornaments made of faience were also deposited, in some cases in very large numbers with several hundred beads

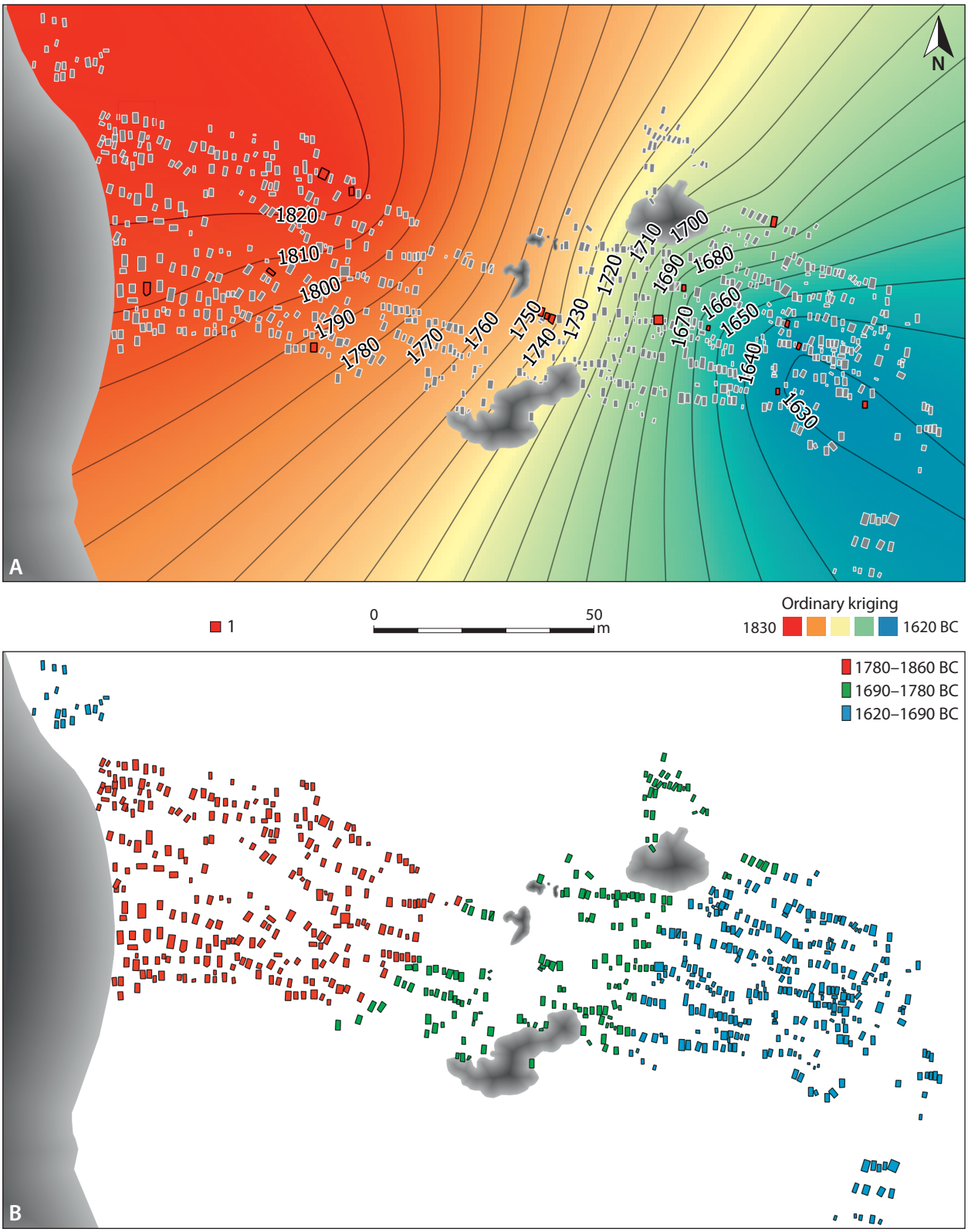

*Fig. 2. Model of spatio-temporal cemetery development: **A** radiocarbon dated graves marked in red; **B** division of graves into three chronological phases (after Jaeger* et al. *2023a).*

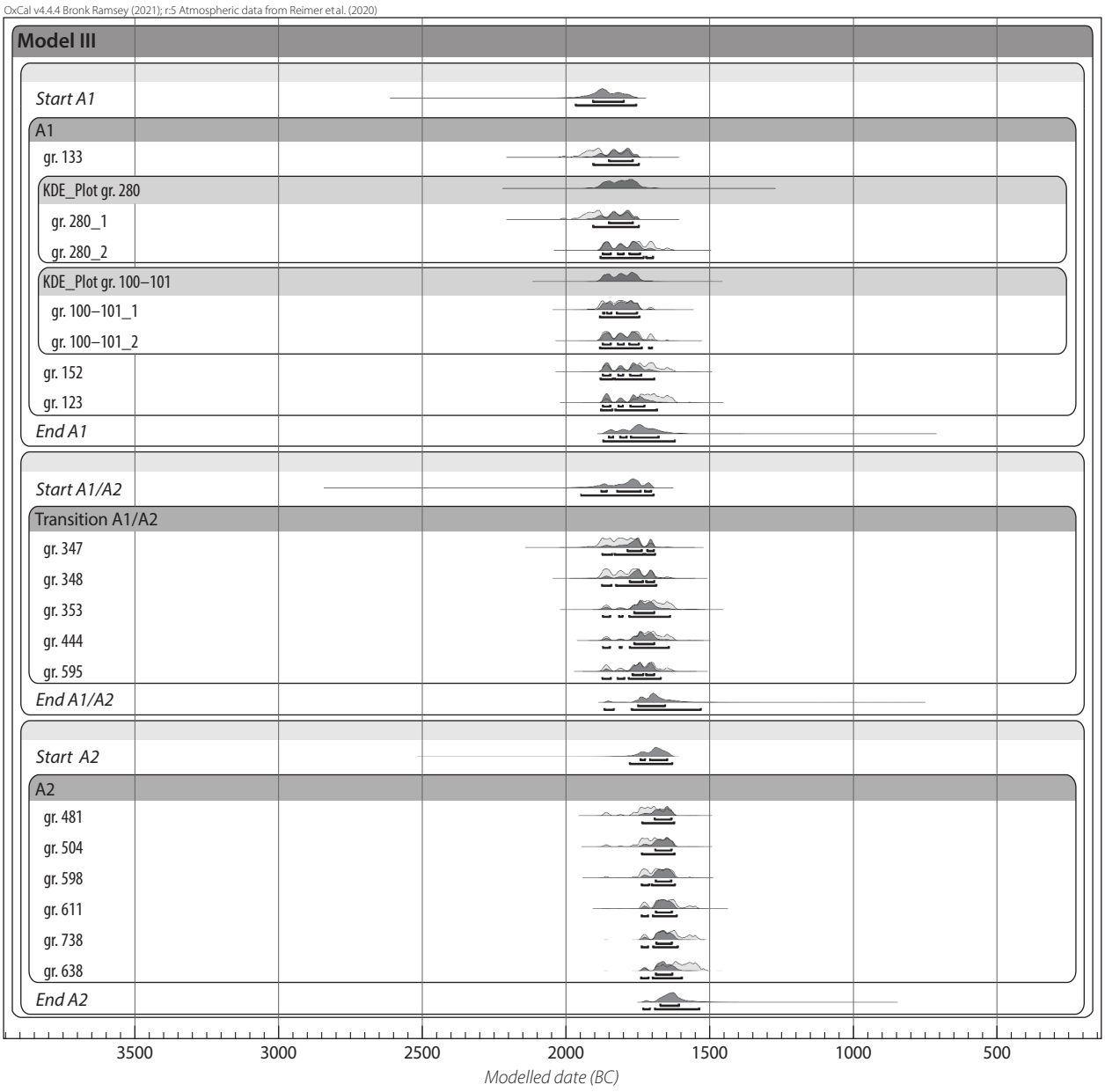

Fig. 3. Three-phase chronological model of ^{14}C dates, Model III (after Jaeger et al. *2023a).*

(e. g. grave 118 with a necklace consisting of 3252 beads). In later burials (A2), the number of burials furnished with bronze, gold and amber objects increased. New, stylistically non-local and more elaborate forms of pins (*Kugelkopf* and *Hülsenkopf* types) appeared, as well as a few heavier tools (chisels, awls) and rarely weapons (few ornamented daggers, one specimen of a low-flanged axe; Fig. 4). In this period, a greater unification of the equipment of the deceased of both sexes is noticeable (Jaeger *et al.* 2023a). Significant changes can be also observed in the cemetery space. In the earlier phase, clusters of burials in frames of particular rows usually included about four graves. In the later phase of the cemetery, in contrast, clusters of seven or more burials prevail. This probably indicates a different type of relationship between the deceased during their lives (Jaeger *et al.* 2021).

As in other regions of Early Bronze Age Slovakia, cases of secondary grave opening were identified in Nižná Myšľa. In total, traces of disturbances of 90 graves were identified (Olexa and Nováček 2013; 2015; 2017). In the vast majority, burials were reopened near the upper body of the deceased, including the skull. This indicates that the way graves were marked on the surface also carried information regarding the orientation of the body, and thus the sex of the deceased.

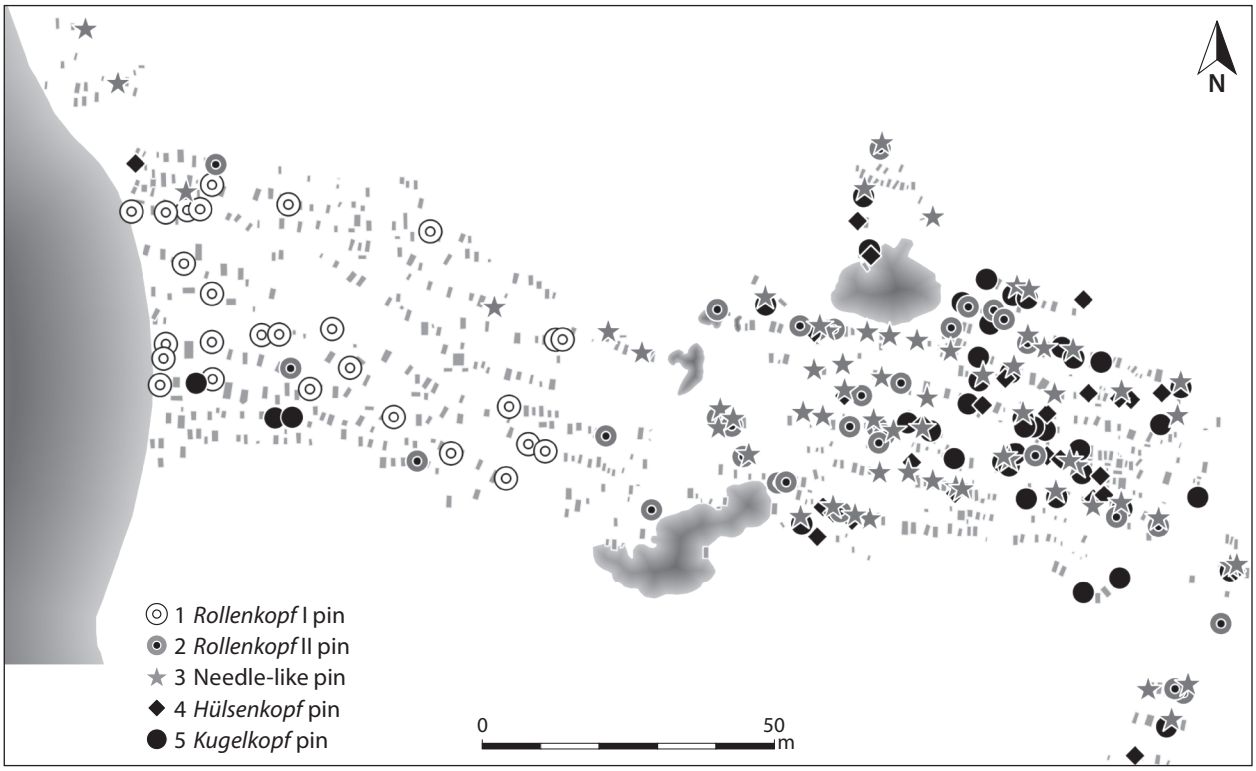

Fig. 4. Distribution of selected types of bronze pins in the cemetery (after Jaeger et al. *2023a).*

The differences observed in grave goods between earlier and later burials, as identified in the study of the absolute chronology of the cemetery and the increase in metal finds, likely corresponded to the development of new relationships between the local community and other areas in the Early Bronze Age central region. The increase in the number of burials equipped with Baltic amber beads (Jaeger *et al.* 2023b), along with a rise in the quantity of beads used for making ornaments in later burials, may suggest the regions northwest of Nižná Myšľa (specifically, the areas of Western Slovakia, Moravia, and Czechia) as the origin of new styles of bronze objects (*Hülsenkopf* and *Kugelkopf* pins), the raw material for bronze production, and succinite itself.

EARLY PHASE MALE BURIALS IN NIŽNÁ MYŠĽA

Exotic Goods and Local Raw Materials

Throughout the cemetery's history, the burial ritual emphasised sex differences, drawing from the Late Neolithic tradition of the Corded Ware Culture by arranging the bodies of the deceased differently within the grave pits. In the A1 phase, the burial equipment also served to accentuate these differences. Initially, a relatively small number of items and ceramic vessels were placed with the deceased. Certain deviations from the general rule of relatively modest grave offerings can be observed only in female burials. Almost exclusively in women's burials, ornaments made of exotic materials such as succinite (found in 21 out of 23 graves with amber; Jaeger *et al.* 2023b), faience, and exceptionally gold (which became more prevalent in the later phase of the cemetery) were deposited. In several cases and only in female graves, faience was used to create exceptionally complex decorations composed of hundreds and thousands of beads. In contrast, male burials were primarily equipped with ceramic vessels and items crafted from locally available materials (bone, antler, obsidian, shells) and small, simple bronze ornaments, such as *Rollenkopfnadel* I type pins and necklaces made of single faience beads and bronze spirals. Additionally, male burials occasionally included bronze Lockenringe, which were much more common in female burials (Ginalski *et al.* 2019). The most numerous grave goods in male burials were bone awls, boar tusks and ornaments made of them.

Weapons

In the early phase of the cemetery, only five graves (graves: 75, 82, 122, 242, and 271) contained bronze daggers (Olexa and Nováček 2013), traditionally seen as a material expression of the forming Early Bronze Age warrior male identity (Schwenzer 2004; Weinberger 2008; Frieman 2012). All specimens lack decorations, which are notably characteristic only of the later phase of Otomani-Füzesabony metalworking development (David 2002). The daggers from early graves exhibit significant use wear traces, suggesting a functional use (as cutting tools) rather than prestigious significance. Male burials with daggers were devoid of additional items that could indicate the social status of their owners. With the exception of grave 271, all the other burials fall into the category of poorly-furnished graves. For instance, grave 82 had three vessels, while graves 122 and 242 each contained a single vessel. Grave 75, in contrast, included a single vessel along with a stone whetstone. Again, with the exception of grave 271, these burials did not feature the common items typically found in A1 phase male burials, such as bone awls, wild boar tusks, pendants, plates/applications made from them, or less common items like simple *Rollenkopfnadel* I type pins (Jaeger *et al.* 2023a).

Interpreting burials equipped with daggers from phase A1 as the graves of a warrior male elite — a designation often attributed as the primary characteristic of the Otomani-Füzesabony culture — is challenging.

The other category of weapons found in Nižná Myšľa A1 phase burials are arrowheads. Altogether, 18 such graves were discovered; these were exclusively male burials (graves: 2, 6, 27, 30, 53, 65, 156, 160, 168, 183, 197, 202, 215, 220, 268, 270, 273, 279). The material used in all cases was identified as obsidian from Eastern Slovakia. In three cases, besides obsidian arrowheads, flakes from this raw material were also deposited as grave goods (graves 53, 156, 160; Olexa and Nováček 2013; Fig. 5.6).

The precise typological classification of arrowheads is rather complicated due to their function as projectiles. Most of them suffered damage and were repaired (Kaňakova *et al.* 2019). Therefore, the original form given by the manufacturer might have undergone significant changes. Essentially, a certain type classification, understood as the form initially given by the manufacturer, applies only to those specimens that can be recognised as items not used as projectiles through traceological analyses. Such analyses were not conducted for the Nižná Myšľa finds. The basis for general classification relies solely on the drawings presented in the publication (Olexa and Nováček 2013). Based on these, the arrowheads from Nižná Myšľa can be classified as typical for extensive areas of Central and Eastern Europe, specifically the so-called "heart-shaped arrowheads" used by Late Neolithic and Early Bronze Age communities (Fig. 5.4). The specimens from the discussed site do not differ from examples known from other sites in Slovakia (of the Nitra Culture) and the neighbouring Małopolska region of Poland (Mierzanowice Culture) (Borkowski and Kowalewski 1997; Kaňáková 2020).

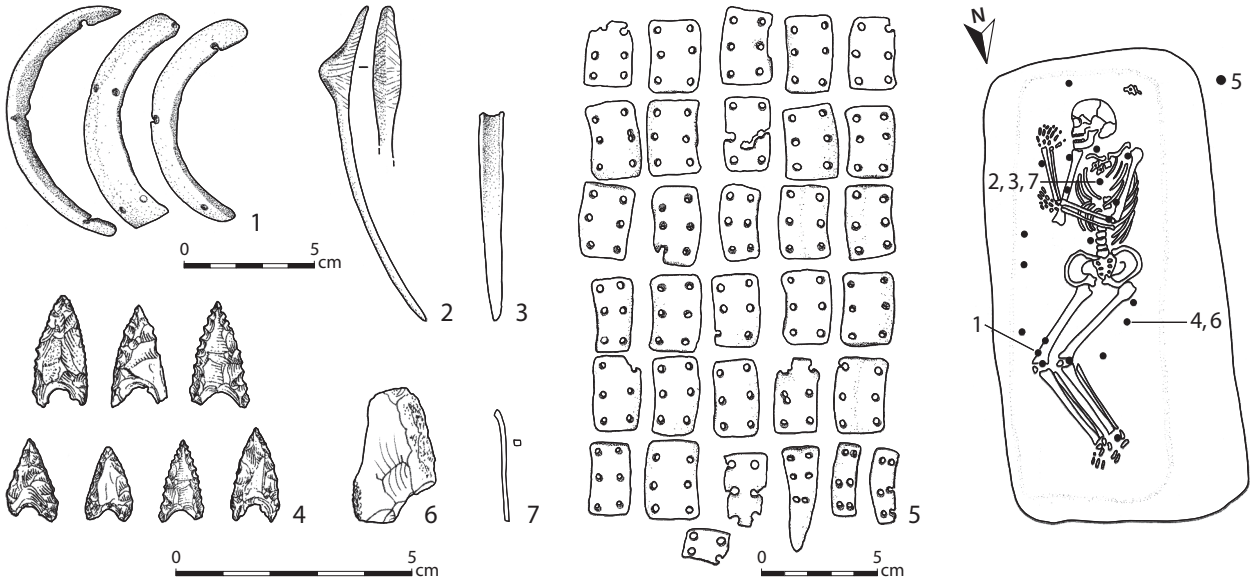

*Fig. 5. Male burial (grave 53) with typical A1-phase grave goods. **1** boars tusk pendants, **2–3** bone awl (fragment), **4** obsidian arrowheads, **5** plates/applications made from wild boar tusks, **6** obsidian flake, **7** unspecified bronze fragment (after Olexa and Nováček 2013).*

Contrary to appearances, interpreting the significance of the presence of arrowheads in graves is not an easy task. Two views clash in the literature on this issue.

The first points to the symbolic meaning of arrowheads, which, instead of being used as actual projectiles, merely symbolise the status and an attempt to construct the identity of a warrior and/or hunter within the burial ritual. Such views were primarily proposed in relation to high-quality arrowheads, specimens made from exceptional raw materials or placed in graves as single specimens (Sarauw 2007; Sosna 2012; Nicolas and Guéret 2014).

According to the second approach, arrowheads should be perceived as functional items providing evidence of the importance of archery as a daily activity. In this context, crucial evidence can include specific traces of arrowhead attachment, traces left after hitting specific targets and resulting from storage and transportation in a quiver, as well as quantity, suggesting the presence of a complete set of arrows in the grave (Kaňáková *et al.* 2019; Kaňáková 2020). As mentioned, in the case of the finds from Nižná Myšľa, we do not have the results of special analyses or precise descriptions of the arrowheads themselves, which would allow even the determination of traces of attachment. Therefore, to indicate possible ways of interpreting the significance of arrowhead presence in graves, we should focus on the manner and context of their deposition.

In eight cases, a single arrowhead was deposited with the deceased. In five graves, two arrowheads were discovered, while three specimens were found in one grave. In other cases, the equipment of burials consisted of a larger number of arrowheads (arrows?), i. e., 5, 6, 7 and 9 specimens. It is noteworthy that burials with a larger number of arrowheads did not generally differ from those where only single pieces were deposited. In grave number 53, seven arrowheads were discovered, and it stood out due to the presence of 32 plates/applications made from wild boar tusks (Fig. 5.5). However, the same plates/applications were also found in grave 65 (two arrowheads and 15 plates/applications) and in grave 168 (two arrowheads and 46 plates/applications).

Single specimens can primarily be treated as items symbolising archery. However, in some cases, the information derived from anthropological analyses confirms the use of the bow as an effective and deadly weapon. For example, grave 215 (adult male) shows evidence of perimortem trauma on the thoracic vertebra (Hukeľová 2017). In the case of more numerous arrowheads, we can speak of the deposition of a complete set of arrows in the grave, most probably used by the deceased. In this context, grave number 279 is noteworthy, in which, among 6 arrowheads, there was also a specimen broken in a manner suggesting a strike against a hard target (Olexa and Nováček 2013).

HUNTERS FROM NIŽNÁ MYŠĽA

Men buried with arrowheads can be classified as warriors and/or hunters. These roles did not necessarily have to be, and likely were not, distinct social roles. In the context of the discussed community, the importance of hunting is not only evident in graves containing arrowheads but also supported by the analysis of grave goods found in all A1 phase male burials. They demonstrate that the most numerous items in the burial equipment of men in Nižná Myšľa were bone awls, wild boar tusks and ornaments made from them, including pendants and plates/applications (Fig. 5.1, 3, 5; Fig. 6). General information about faunal materials from the Otomani-Füzesabony settlements in Slovakia only allows the conclusion that animal husbandry predominated over hunting for wild animals (Gašaj 2002; Jaeger 2011). However, the burial equipment of A1 male burials from Nižná Myšľa may be a significant indication, demonstrating the crucial role of wild boar hunting among men. The importance of this activity, however, was not closely linked to the acquisition of animal proteins and food. Instead, it primarily pertained to the symbolic and social significance of hunting as a component of male identity.

Although wild boar did not seemingly constitute an important element of the diet beyond the Mesolithic period (Magnell 2005; Skoglund 2018; Schmölcke 2019), its symbolic significance became pronounced in later periods. Prestige and recognition associated with the skill of hunting this particular animal are enduring themes in European culture and beyond (Cultraro 2004). This is evident in Scandinavian Bronze Age rock art and present in the rich iconography of the Iron Age (Bartnik 2012; Skoglund 2018). In the world of Mediterranean civilizations of the 2nd millennium BCE, the wild boar represents danger, the overcoming of which requires special courage (Mycenaeans) or constitutes an element of religious iconography (Hittites) (Cultraro 2004; Dalix and Vila 2007). Ancient Greek and Roman authors (e. g. Xenophon and Polybius) not only left detailed descriptions of wild boar hunting techniques but also emphasised the importance of this activity as, on the one hand, an element of upbringing and, on the other hand, a kind of rite of passage for young men aspiring to key roles in their communities (Anderson 1985; Papakostas 2020).

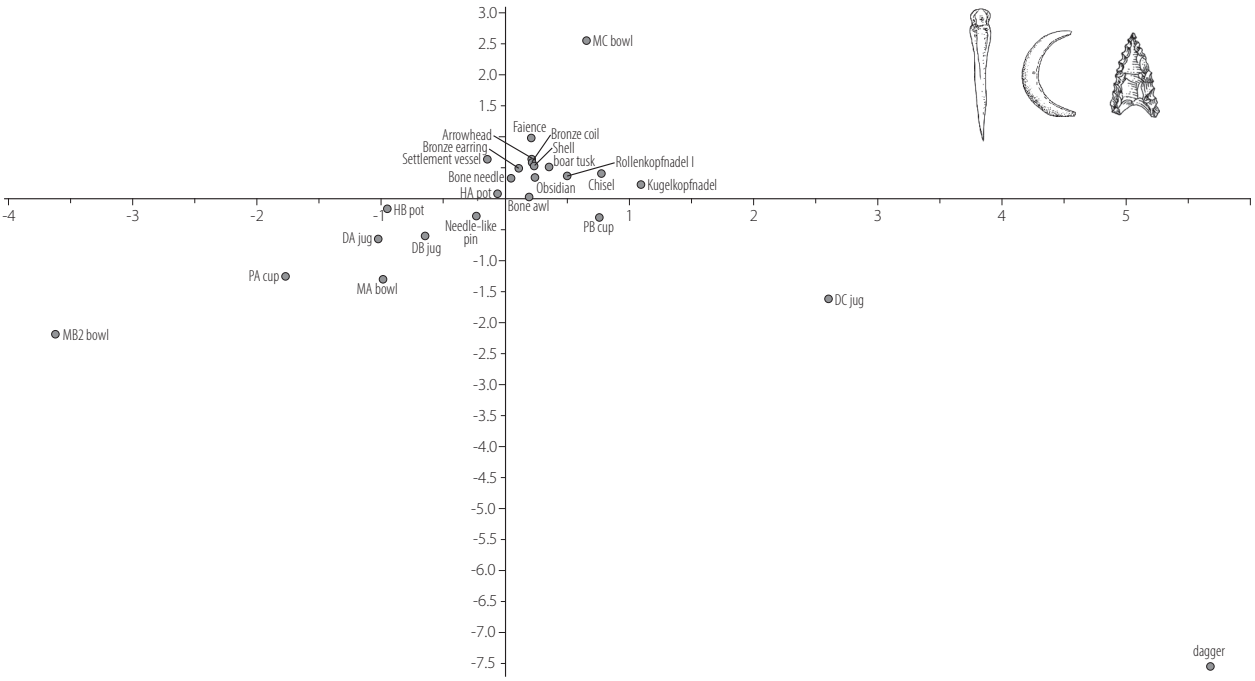

Fig. 6. Results of correspondence analysis of A1 phase grave goods from male burials (shown on the 1st and the 2nd eigenvectors; vessel types after Nováček 2017; drawings Mateusz Stróżyk).

The information left by the mentioned classical authors allow us to reconstruct wild boar hunting techniques used in the ancient world and developed (though unchanged in basic elements, such as the type of weapons used) in the medieval and post-medieval periods (Marek 2009). Due to the physical characteristics of the wild boar (a larger and presumably more dangerous animal in prehistory than in modern times; Skoglund 2018), hunting often took place in pairs, although an example of exceptional bravery was solo confrontation with the beast. The weapon used by the hunters was a spear. Regarding Nižná Myšľa and the weaponry used for wild boar hunting, we are compelled to infer *ex silentio*. Bronze specimens of such weapons are not known from the discussed cemetery. Therefore, it should be assumed that boar hunting was carried out with wooden spears, the knowledge of which in Central Europe dates back tens of thousands of years (Schoch *et al.* 2015). Once again, we lack evidence of depositing such items in the burials at Nižná Myšľa. However, insights into the use of various wooden objects and weapons in the Eneolithic and the Bronze Age come from a series of finds in various regions of Europe. Examples include numerous finds from the Tollense battlefield (Jantzen *et al.* 2011), the equipment of the famous Ötzi iceman mummy (Spindler 2009), or discoveries from settlements such as Bruszczewo (Müller 2012).

CONCLUSION

The differences in the way the deceased were equipped in phases A1 and A2 indicate a transformation of the local community and a shift within burial rituals from patterns typical of the Late Neolithic/Eneolithic to those that can be associated with the Early Bronze Age, understood as an epoch based on metal use and circulation. The image of the local community in the stage of its formation in no way resembled developed Bronze Age societies that would remain within the sphere of influence of distant palace cultures in the Mediterranean Basin. In light of recent research, it seems more plausible that the local community in the early 1st half of the 2nd millennium BCE adhered to post-Neolithic traditions, abstaining from significant quantities of complex bronze objects and relying on materials such as bone, antler, and flint (Jaeger *et al.* 2023a). A similar rejection of metallurgical innovations has been documented for Early Bronze Age communities in Southeastern Poland (Mierzanowice Culture). It is important to emphasise that this region maintained close and intensive relations with the area of Eastern Slovakia, forming a larger cultural area

known as the so-called "Carpathian Epicorded Cultural Circle" (Kadrow 1994). Similar to the mentioned communities of the Mierzanowice culture (Kadrow 1995), the Late Neolithic/Eneolithic way of equipping the deceased in early burials in Nižná Myšľa likely served as a symbolic reference to the ethos and tradition of hunting, within the context of practically implementing agricultural and pastoral economic patterns. Information from the research on the older fortified settlement in Nižná Myšľa, directly associated with the discussed cemetery, distinctly points to the predominant role of cattle, pig, and goat/sheep husbandry, along with a wide spectrum of cultivated grains (Gašaj 2002; Jaeger 2011).

However, the above observations do not only refer to the process of the specific formation of a new identity under the influence of building new trade and exchange relations and the influx of metal but also provide a significant chronological clue. As mentioned earlier, the chronological model presented elsewhere, based on radiocarbon dating, indicates the 19th century BCE as the beginning of burying the deceased in Nižná Myšľa (Jaeger *et al.* 2023a). It is essential to bear in mind, however, that this model, for independent reasons, could not be constructed based on radiocarbon dates from the oldest graves in a typological sense. The use of available radiocarbon dates for some artefacts from other regions of Central Europe (Stockhammer *et al.* 2015), also known from the early burials in Nižná Myšľa, allows for the hypothesis of an earlier beginning of the discussed cemetery (Jaeger *et al.* 2021).

The cemetery began to function at a time when the local community still constituted an element of the vast post-Corded Ware Culture world, where the crucial role of men — warriors and hunters — was just beginning to erode in the face of new phenomena. It seems likely that the intensive development of animal husbandry and agriculture among the Otomani-Füzesabony communities gradually influenced and transformed social relations (Graeber and Wengrow 2023). In the emerging socio-economic reality, the role of women was growing, as evidenced by exceptionally richly equipped burials containing amber, large quantities of faience, and even gold. The male-warrior-hunter was no longer a central figure in the economic dimension. However, his status was still emphasised within the burial rites. Embedded in the chronological dimension already in the Early Bronze Age, the community continued, in line with Late Neolithic/Eneolithic patterns, to emphasise sex differences in burial rituals and instructed men to be buried with items attesting to their courage in the encounter with wild animals.

REFERENCES

Anderson, J.K., 1985. *Hunting in the Ancient World*. Berkeley: University of California Press.

Bader, T., 1998. Bemerkungen zur Bronzezeit im Karpatenbecken. Otomani/Füzesabony-Komplex. Überblick und Fragestellung. *Jahresschrift für Mitteldeutsche Vorgeschichte* 80, 43–108. https://doi.org/10.11588/jsmv.1998.1.83073

Bartnik, A., 2012. *Moccus. Dzik w wierzeniach starożytnych Celtów.* Katowice: Wydawnictwo Uniwersytetu Śląskiego.

Bátora, J., 2000. Problematika sekundárneho otvárania hrobov v kultúrach staršej doby bronzovej na juhozápadnom Slovensku. *In:* S. Kadrow, ed. *A Turning of Ages. Jubilee Book to Professor Jan Machnik on his 70th Anniversary*. Kraków: Instytut Archeologii i Etnologii PAN, 1–24.

Borkowski, W. and Kowalewski, M., 1997. Krzemienne groty strzał z epoki brązu z terenów Mazowsza i Podlasia. *In:* J. Lech and D. Piotrowska, eds. *Z badań nad krzemieniarstwem epoki brązu i wczesnej epoki żelaza. Materiały sympozjum zorganizowanego w Warszawie 20–22 października 1994 r.* Warszawa: Polska Akademia Nauk, Komitet Nauk Pra- i Protohistorycznych, 205–214.

Cultraro, M., 2004. Exercise of Dominance: Boar Hunting in Mycenaean Religion and Hittite Royal Rituals. *In:* M. Hutter and S. Hutter-Braunsar, eds. *Offizielle Religion, lokale Kulte und individuelle Religiosität.* Münster: Ugarit Verlag, 117–135.

Dalix, A.-S. and Vila, E., 2007. Wild boar hunting in the Eastern Mediterranean from the 2nd to the 1st millennium BC. *In:* U. Albarella, K. Dobney, A. Ervynck and P. Rowley-Conwy, eds. *Pigs and Humans: 10,000 Years of Interaction*. Oxford: Oxford University Press, 359–372. https://doi.org/10.1093/oso/9780199207046.003.0031

David, W., 2002. *Studien zu Ornamentik und Datierung der bronzezeitlichen Depotfundgruppe Hajdúsámson-Apa-Ighiel-Zajta*. Alba Iulia: Verlag ALTIP S.A.

Fischl, K.P. and Kienlin, T.L., eds., 2019. *Beyond divides – The Otomani-Füzesabony phenomenon. Current approaches to settlement and burial in the north-eastern Carpathian Basin and Adjacent Areas,* Universitätsforschungen zur prähistorischen Archäologie 345. Bonn: Habelt.

Fischl, K.P. and Olexa, L., 2019. The settlement network of the Otomani-Füzesabony cultural complex in the southern Hornád Valley and the Košice Basin. *In: Fischl and Kienlin 2019*, 121–142.

Frieman, C.J., 2012. Flint Daggers, Copper Daggers, and Technological Innovation in Late Neolithic Scandinavia. *European Journal of Archaeology* 15(3), 440–464. https://doi.org/10.1179/1461957112Y.0000000014

Gašaj, D., 2002. Osady warowne i życie gospodarcze – Fortified settlements and their economic life. *In:* J. Gancarski, ed. *Między Mykenami a Bałtykiem. Kultura Otomani-Füzesabony/Between Mycenae and the Baltic Sea. The Otomani-Füzesabony Culture*. Krosno and Warszawa: Muzeum Podkarpackie w Krośnie, 21–51.

Ginalski, J., Kotowicz, P., Przybyła, M.S. and Wyrostkiewicz, R., 2019. Supposed bronze age hoard of golden artefacts from the defensive settlement on the "Horodyszcze" Hill in Trepcza (Polish Carpathians). *In:* M.S. Przybyła and K. Dzięgielewski, eds. *Chasing Bronze Age rainbows: studies on hoards and related phenomena in prehistoric Europe in honour of Wojciech Blajer*. Kraków: Instytut Archeologii Uniwersytetu Jagiellońskiego, 463–482.

Gogâltan, F., 2017. The Bronze Age Multilayered Settlements in the Carpathian Basin (c. 2500–1600/1500 BC). An old catalogue and some chronological problems. *Journal of Ancient History and Archaeology* 4(3), 28–55.

Graeber, D. and Wengrow, D., 2023. *The Dawn of Everything: A New History of Humanity*. New York: Picador.

Hukeľová, Z., 2017. *Comparative osteoarchaeological perspectives on health and lifestyle of Neolithic, Chalcolithic and Early Bronze Age populations from Slovakia, Moravia and Bohemia*. Unpublished PhD dissertation, University of Edinburgh.

Jaeger, M., 2010. Transkarpackie kontakty kultury Otomani-Füzesabony (The Trans-Carpathian contacts of the Otomani-Füzesabony culture). *In:* J. Gancarski, ed. *Transkarpackie kontakty kulturowe w epoce kamienia, brązu i wczesnej epoce żelaza*. Krosno: Muzeum Podkarpackie w Krośnie, 313–329.

Jaeger, M., 2011. The Relationship Between Man and Environment in the Current Stage of Research of Fortified Settlements in the Carpathian Basin in the First Half of the 2nd Millenium BC. *In:* I. Hildebrandt-Radke, W. Dörfler, J. Czebreszuk and J. Müller, eds. *Anthropogenic Pressure in the Neolithic and the Bronze Age on the Central European Lowlands*. Poznań: Bogucki Wydawnictwo Naukowe, 149–159.

Jaeger, M., 2014. The stone fortifications of the settlement at Spišský Štvrtok. A contribution to the discussion on the long-distance contacts of the Otomani-Füzesabony culture. *Praehistorische Zeitschrift* 89, 291–304.

Jaeger, M., 2016. Bronze Age fortified settlements in Central Europe. *Studien zur Archäologie in Ostmitteleuropa/Studia nad Pradziejami Europy Środkowej* 17. Poznań: Wydawnictwo Nauka i Innowacje.

Jaeger, M., 2017. Bronze Age defensive settlement in the context of long-range relationships: how far is it from fortified villages to citadels?. *In:* S. Hansen and J. Müller, eds. *Rebellion and Inequality in Archaeology*. Universitätsforschungen zur prähistorischen Archäologie 345. Bonn: Habelt, 186–205.

Jaeger, M., Stróżyk, M., Olexa, L. and Nováček T., 2021. Dating the ladies. Spatio-temporal development of the Early Bronze Age Cemetery at Nižná Myšľa (Slovakia). *Documenta Praehistorica* 48, 340–353. https://doi.org/10.4312/dp.48.21

Jaeger, M., Stróżyk, M. and Olexa, L., 2023a. Society in transition: cultural change in the Early Bronze Age cemetery at Nižná Myšl'a in the light of absolute chronology. *Radiocarbon* 65(1), 135–154. https://doi.org/10.1017/RDC.2022.76

Jaeger, M., Oravkinová, D., Piszora, P., Olexa, L. and Soják, M., 2023b. Early Bronze Age amber in Slovakia. Chronology, mechanisms of exchange and acceptance of the new raw material. *Praehistorische Zeitschrift* 99(1), 339–369. https://doi.org/10.1515/pz-2023-2014

Jantzen, D., Brinker, U., Orschiedt, J., Heinemeier, J., Piek, J., Hauenstein, K., Krüger, J., Lidke, G., Lübke, H., Lampe, R., Lorenz, S., Schult M. and Terberger, T., 2011. A Bronze Age battlefield? Weapons and trauma in the Tollense Valley, north-eastern Germany. *Antiquity* 85(328), 417–433. https://doi:10.1017/S0003598X00067843

Kadrow, S., 1994. Social Structures and Social Evolution Among Early Bronze-Age Communities in South-Eastern Poland. *Journal of European Archaeology* 2(2), 229–248. https://doi:10.1179/096576694800719148

Kadrow, S., 1995. *Gospodarka i społeczeństwo. Wczesny okres epoki brązu w Małopolsce*. Kraków: Instytut Archeologii i Etnologii PAN.

Kaňáková, L., 2020. Lithic Arrowheads of the Nitra Culture – The Use of Actual and Experimental Use-Wear Analyses to Identify the Differential Effects of Quiver Transportation. *Lithic Technology* 45(4), 283–294. https://doi: 10.1080/01977261.2020.1795337

Kaňakova, L., Bátora, J. and Nosek, V., 2019. Use-wear and ballistic analysis of warrior arrowheads from the burial ground of Nitra culture at Holešov-Zdražilovska, Moravia. *Journal of Archaeological Science: Reports* 29, 102–126. https://doi.org/ 10.1016/j.jasrep.2019.102126

Kienlin, T.L., 2015. *Bronze Age Tell Communities in Context. An exploration into culture, society, and the study of European prehistory – Part 1. Critique: Europe and the Mediterranean*. Oxford: Archaeopress.

Kristiansen, K. and Larsson, T.B., 2005. *The rise of the Bronze Age society. Travels, transmissions and transformations*. Cambridge: Cambridge University Press.

Magnell, O., 2005. Harvesting Wild Boar – a study of prey choice by hunters during the Mesolithic in South Scandinavia by analysis of age and sex structures in faunal remains. *Archaeofauna* 14, 27–41.

Makarowicz, P., 1999. The Problem of the Reception of Otomani Culture Patterns on the Polish Lowlands. *In:* J. Gancarski, ed. *Kultura Otomani-Füzesabony. Rozwój, chronologia, gospodarka. Materiały z międzynarodowej konferencji archeologicznej w Dukli 27.–28.11.1997*. Krosno: Muzeum Podkarpackie w Krośnie, 211–228.

Marek, L., 2009. Boar- and bear-hunting in post-medieval Silesia. *Fasciculi Archaeologiae Historicae* 22, 101–107. https://journals.iaepan.pl/fah/article/view/1421

Müller, J., 2012. Research on Neolithic and Early Bronze Age wetland sites on the North European Plain. *In:* M.S. Midgley and J. Sanders, eds. *Lake Dwellings after Robert Munro*. Amsterdam: Sidestone Press, 47–83.

Nicolas, C. and Guéret C., 2014. Armorican Arrowheads Biographies: Production and Function of an Early Bronze Age prestige good from Brittany (France). *Journal of Lithic Studies* 1(2), 101–128. https://doi.org/10.2218/jls.v1i2.1126

Nováček, T., 2017. *Vyhodnotenie materiálu pohrebiska otomansko-füzesabonyského kultúrneho komplexu v Nižnej Myšli (hroby 1–792)*. PhD thesis. Brno: Masarykova univerzita, Filozofická fakulta.

Olexa, L., 2002. Cmentarzyska i ceremoniał pogrzebowy/ Burial grounds and funeral ceremonies. *In:* J. Gancarski, ed. *Między Mykenami a Bałtykiem. Kultura Otomani-Füzesabony*. Krosno and Warszawa: Muzeum Podkarpackie w Krośnie, 53–85.

Olexa, L., 2003. *Nižná Myšľa. Osada a pohrebisko z doby bronzovej*. Košice: Archeologický ústav Slovenskej akadémie vied v Nitre.

Olexa, L. and Nováček, T., 2013. *Pohrebisko zo staršej doby bronzovej v Nižnej Myšli, Katalóg I (hroby 1–310)*. Nitra: Vydavateľstvo Slovenskej akadémie vied Bratislava.

Olexa, L. and Nováček, T., 2015. *Pohrebisko zo staršej doby bronzovej v Nižnej Myšli, Katalóg II (hroby 311–499)*. Nitra: Vydavateľstvo Slovenskej akadémie vied Bratislava.

Olexa, L. and Nováček, T., 2017. *Pohrebisko zo staršej doby bronzovej v Nižnej Myšli, Katalóg III (hroby 500–792*). Nitra: Vydavateľstvo Slovenskej akadémie vied Bratislava.

Papakostas, T., 2020. *Hunting in Ancient Macedonia*. Unpublished M.A. thesis, International Hellenic University.

Polla, B., 1960. Birituelle Füzesabonyer Begräbnisstätte in Streda nad Bodrogom. *In:* B. Chropovský, M. Dušek, M. and B. Polla, eds. *Pohrebiská zo staršej doby bronzovej na Slovensku I. Bratislava*. Bratislava: Vydavateľstvo Slovenskej Akadémie Vied, 299–386.

Sarauw, T., 2007. Male symbols or warrior identities? The 'archery burials' of the Danish Bell Beaker Culture. *Journal of Anthropological Archaeology* 26(1), 65–87. https://doi.org/10.1016/j.jaa.2006.05.001

Schmölcke, U., 2019. Early Mesolithic hunting strategies for red deer, roe deer and wild boar at Friesack 4, a three-stage Preboreal and Boreal site in northern Germany. *In:* D. Groß, H. Lübke, J. Meadows and D. Jantzen, eds. *Working at the Sharp End: From Bone and Antler to Early Mesolithic Life in Northern Europe*. Kiel/Hamburg: Wachholtz. https://doi.org/10.23797/9783529018619-8

Schoch, W.H., Bigga, G., Böhner, U., Richter, P. and Terberger, T., 2015. New insights on the wooden weapons from the Paleolithic site of Schöningen. *Journal of Human Evolution* 89, 214–225.

Schwenzer, S., 2004. *Frühbronzezeitliche Vollgriffdolche. Typologische, chronologische und technische Studien auf der Grundlage einer Materialaufnahme von Hans-Jürgen Hundt*. Mainz: Verlag des Römisch-Germanischen Zentralmuseums.

Sherratt, A., 1987. Warriors and traders: Bronze Age chiefdoms in central Europe. *In:* B.W. Cunliffe, ed. *Origins*. London: BBC Publications, 54–66.

Sherratt, A., 1994. What Would a Bronze-Age World System Look Like? Relations Between Temperate Europe and the Mediterranean in Later Prehistory. *Journal of European Archaeology* 1(2), 1–58. https://doi:10.1179/096576693800719293

Skoglund, P., 2018. The wild boar in Scandinavian rock art. *In:* J. Dodd and E. Meijer, eds. *Giving the Past a Future: Essays in Archaeology and Rock Art; Studies in Honour of Dr. Phil. h.c. Gerhard Milstreu*. Oxford: Archaeopress, 112–120.

Sosna, D., 2012. Stone arrowheads from Hoštice-I: use-wear analysis. *In:* A. Matějíčková and P. Dvořák, eds. *Funerary Areas of the Bell Beaker Period on the D1 Vyškov-Mořice Motorway. Pravěk. Supplementum* 24/I. Brno: Ústav archeologické památkové péče, 323.

Spindler, K., 2009. Entdeckung und Bergung. *In:* M. Egg and K. Spindler, eds. *Kleidung und Ausrüstung der kupferzeitlichen Gletschermumie aus den Ötztaler Alpen*. Mainz: Schnell & Steiner, 19–37.

Stockhammer, P.W., Massy, K., Knipper, C., Friedrich, R., Kromer, B., Lindauer, S., Radosavljević, J., Wittenborn, F. and Krause, J., 2015. Rewriting the Central European Early Bronze Age Chronology: Evidence from Large-Scale Radiocarbon Dating. *PLoS ONE* 10(10), e0139705. https://doi.org/10.1371/journal.pone.0139705

Vandkilde, H., 2014. Breakthrough of the Nordic Bronze Age: transcultural warriorhood and a Carpathian crossroad in the sixteenth century BC. *European Journal of Archaeology* 17(4), 602–633. https://doi:10.1179/1461957114Y.0000000064

Vladár, J., 1973. Osteuropäische und mediterrane Einflüsse im Gebiet der Slowakei während der Bronzezeit. *Slovenská Archeológia* 21, 253–357.

Weinberger, S., 2008. *Warfare in the Austrian Weinviertel during the Early Bronze Age*. Wien: Verlag der Österreichischen Akademie der Wissenschaften. https://doi.org/10.1553/0x00185c80

Symboldolch statt Aunjetitzer Schmuckschild

Bemerkungen zu einer mehr als 160 Jahre währenden Fehlinterpretation

Harald Meller

KEYWORDS: *Early Bronze Age, Únětice culture, 'Schmuckschild' ('decorative shield'), symbolic dagger*

„[…] muß dann in mir so deutlich und unsichtbar sein wie das Versteckte in einem Vexierbild, in dem man auch niemals etwas finden würde, wenn man nicht wüßte, daß es drin steckt.“
(Franz Kafka, Tagebuch 1911, 30. September [Kafka 1990, 47])

Zusammenfassung

Die in der Forschung zur Frühbronzezeit bislang als Aunjetitzer Schmuckschilde bezeichneten flachen und verzierten Bronzeobjekte konnten anlässlich eines Neufundes aus Storkau, Lkr. Stendal (Sachsen-Anhalt, Deutschland), zweifelsfrei als stilisierte und symbolische Darstellungen von Dolchen identifiziert werden. Ihre Verzierung gleicht in vielen Fällen denen der echten Dolchklingen bis ins Detail, ähnliches gilt für die Form. Die Symboldolche können in vier Typen gegliedert werden, wobei Typ 1 im 20. Jh. v. Chr. in Böhmen und Mähren vorkommt, während die etwas jüngeren Typen 2–4 in Mitteldeutschland und Polen auftreten. Die in Horten gefundenen Symboldolche können als Distinktionsmittel interpretiert werden, die möglicherweise auch Frauen von hohem Rang auszeichneten. Reiche Frauen sind in der mitteldeutschen Aunjetitzer Kultur wegen spezieller Deponierungssitten nicht in Gräbern, sondern vielleicht nur anhand von Bernsteinschmuck und Symboldolchen in Hortfunden zu fassen. Andererseits könnte es sein, dass die jüngeren Typen von Symboldolchen, nach einer ersten Entwicklung in Böhmen und Mähren, in den Gebieten nördlich der Aunjetitzer Kultur als Statussymbole dienten und dort anstelle von echten Dolchen deponiert wurden. Auf jeden Fall zeigt sich, wie überkommene Deutungsmuster und Terminologien auch unsere archäologischen Interpretationen bestimmen.

Abstract

The flat and decorated bronze objects previously referred to in Early Bronze Age research as 'Aunjetitzer Schmuckschilde' ('Únětice decorative shields') could be identified beyond doubt as stylised and symbolic representations of daggers on the occasion of a new find from Storkau, Stendal district (Saxony-Anhalt, Germany). In many cases, their decoration resembles that of the real dagger blades down to the last detail, and the similar is true for the shape. The symbolic daggers can be categorised into four types, with type 1 occurring in Bohemia and Moravia in the 20th century BCE, while the somewhat younger types 2–4 occur in Central Germany and Poland. The symbolic daggers found in hoards can be interpreted as a means of distinction, which possibly also characterised high-ranking women. In the Central German Únětice culture, rich women cannot be found in graves due to special depositional customs, but perhaps only on the basis of amber jewellery and symbolic daggers in hoard finds. Furthermore, it could be that the younger types of symbolic daggers, after an initial development in Bohemia and Moravia, served as status symbols in the areas north of the Únětice culture and were deposited there instead of real daggers. In any case, it shows how traditional patterns of understanding and terminology also determine our archaeological interpretations.

Unser Jubilar beschäftigte sich mit den verschiedensten Forschungsfeldern. Wie weit gespannt diese sind, zeigt sein Projekt zur Wahrnehmung archäologischer Formen.[1] Dass alles, was wir wahrnehmen, diversen Filtern wie Sehgewohnheiten, Mustererkennung und vorgegebenen Kategorien, aber auch generell eingeschränkten Erkenntnismöglichkeiten, unterliegt, ist spätestens mit dem klassischen Höhlengleichnis von Platon eindrucksvoll benannt (Plat. rep. 7,514–517).

Die moderne Psychologie hat sich ausführlich mit selektiver und multistabiler Wahrnehmung beschäftigt (z. B. Alais und Blake 2005). Es ist völlig klar, dass solche Phänomene ebenso die Disziplin der Ur- und Frühgeschichte betreffen. Auch schon berufsbedingt zur Objektivität verpflichtete Forschende sehen, was Sie bereits wissen, oder besser, was durch eine interpretierbare Benennung des Untersuchungsgegenstandes induziert wird.

Ein unbefangener Blick ist dem oder der Forschenden also möglicherweise bereits durch die überwiegend im Fach akzeptierte und häufig in einer längeren Forschungstradition entstandene Bezeichnung des zu untersuchenden und interpretierenden Fundes erschwert. Dies soll im Folgenden anlässlich eines Neufundes an einem altbekannten Beispiel, den sogenannten Aunjetitzer Schmuckschilden, erörtert werden, deren Bild und damit auch deren Bedeutung und Funktion mehr als 160 Jahre falsch gedeutet wurde. Wie bei einem Vexierbild ist es nach dem erstmaligen Erkennen des eigentlichen Bildinhalts kaum möglich den Fund wieder in seiner bisherigen Interpretation zu sehen.[2] In den ersten Jahren nach der Entdeckung der neuen Form kursierten dafür noch verschiedene Bezeichnungen, wie „Bronzeplatte“, „ornamentiertes Bronzeblech“, „verziertes Schlussstück eines Gürtels“, „silbernes Schildchen“, „Gegenstand von weißer Silberbronze“ oder durch den Altmeister Oskar Montelius (1900) die Nennung als „schildförmiger Gegenstand“. Ab 1902 etablierten sich die Bezeichnungen „Schmuckplatte“ und „Schmuckschild“, wobei „Schmuckschild“

Tabelle 1. Der Überblick über die bisherigen Bezeichnungen von Symboldolchen in der forschungsgeschichtlich bedingt ganz überwiegend deutschsprachigen Literatur zeigt, dass eine umfangreichere Diskussion der Funktion bisher nicht im Vordergrund stand (Tabelle: Florian Michel).

Bezeichnung	Literaturangabe
Zierplatte	von der Hagen 1926, 362; Kossinna 1928, 279
Spatelförmige Kupferplatte	von Wechmar 1854, 56 Fig. 6
Schildförmige Schmuckplatte	Frenzel 1925, 209; Frenzel 1926, 25
Gürtelschmuckplatte	Witter 1938, 264
Zungenförmige Zierplatte	Moucha 2005, 136; 157
Zungenförmiges Blech	Bartík and Zachar 2017, 77
Schildförmige Blechplatte	Seger 1936, 102
Verziertes Schlussstück eines Gürtels	Mertins 1899, 352
Bronzeplatte/ornamentiertes Bronzeblech	Mertins 1896, 342
Silbernes Schildchen	Böttcher 1893,37
Zierplatten	von der Hagen 1926, 362; Bohm 1935, 24; Vogeler 1939, 57
Gürtelscheiben	Hachmann 1957, 149
Bronzeschmuckplatten	Kersten 1951, 444
Seitwärts ausgeschnittene Bronzeplatte	Rzehak and Červinka 1925, 78
Schildförmige Schmuckplatte	Frenzel 1926, 25
Gegenstand von weißer Silberbronze	Koehler and Erzepki 1893, 14
Schmuckscheibe	Petsch 1940, 80
Schmuckplatte	Reinecke 1902, 118; Frenzel 1925, 208–209; Frenzel 1926; von der Hagen 1926, 362; Kersten 1936, 44; Seger 1936, 103; Otto/Witter 1952, 172
Schmuckschild	Müller 1864, 382; Kossinna 1902, 193; Seger 1924; Kossinna 1928, 279; Engel 1930, 206; 222; Redlich 1934, 67; Gandert 1938, 45; Schwantes 1939, 295; Hachmann 1957, 72; Gandert 1957, 35; 37–38; Billig 1958, 79–80; v. Brunn 1959, 57; 68; Jacob-Friesen 1963, 234; Breddin 1969, 43; Metzler 1991, 454; Metzler 1991, 454; Zich 1996, 368; 530; 572; 578; Laux 2000, 34; Reichel 2000, 83; Laux 2017, 115; Hofmann und Nowakowski 2022, 155
Schildförmiger Gegenstand	Montelius 1900, 37; 46
Verzierte Gürtelplatte	Zich 1996, 581

1 ERC Synergy Grants Projekt “XSCAPE: Material Minds: Exploring the Interactions between Predictive Brains, Cultural Artifacts, and Embodied Visual Search”.

2 Seit mindestens 1854 beschrieben, vgl. u. a. von Wechmar 1854, 56 Abb. 6; Müller 1864, 382; Taf. 2.2; Böttcher 1893, 39; Seger 1924; Gandert 1938.

nach 1957 überwog und bis heute vorherrscht (Tabelle 1).

Dies entspricht der Entstehung einer einheitlichen fachlichen Terminologie mit dem Ziel des Abstrahierens, wie dies auch bei der forschungsgeschichtlichen Entwicklung zahlreicher anderer archäologischer Typen zu beobachten ist.

Einige der ehemaligen Bezeichnungen implizieren die Funktion als Trachtbestandteil, selten gehen die Autoren jedoch auf eine spezifische Verwendung genauer ein (Tabelle 2). Sie vermuten hier Panzerteile, Riemenzungen, Gürtel- oder Gewandschmuck, während die heute gängige Bezeichnung Schmuckschild vergleichsweise offenbleibt und die Nutzung als Gürtelschmuck, Kleiderbesatz oder Anhänger bezeichnen kann. Merkwürdigerweise standen gute Anhaltspunkte für die reale Funktion, wie Befestigungselemente mit den Nieten bei Typ 4 (Poniec) und die meist rückseitigen Ösen bei Typ 3 (Storkau), bislang kaum im Zentrum der Betrachtungen.

Tabelle 2. Die bisherigen Funktionsbezeichnungen der Symboldolche (Tabelle: Florian Michel).

Funktionsbezeichnung	**Literaturangabe**
Gürtelbeschlag	Mertins 1899, 352; Rzehak and Červinka 1925, 78; Engel 1930, 206; Gandert 1938, 47
Fraglich	Koehler/Erzepki 1893, 14
Gürtel- oder Gewandschmuck	Reinecke 1902, 118; Witter 1938, 264; Hachmann 1957, 149; Zich 1996, 581
Riemenzunge	Mertins 1896, 342; Mertins 1899, 352
Teil eines Panzers	Böttcher 1893, 39

Die Entdeckung eines Neufundes bei Storkau im Landkreis Stendal (Abb. 1) anlässlich einer Feldbegehung durch den ehrenamtlichen Bodendenkmalpfleger Siegfried Bechtold war der Anlass sich erneut mit der altbekannten Fundgruppe auseinanderzusetzen. Der Fund ist in Bronze gegossen und war fast vollständig erhalten. Er ist in vier Teile zerbrochen, seine Länge beträgt 13,3 cm, seine Breite 6,6 cm.

Schon bei der ersten Betrachtung des Fundes mit nach unten gerichteter Spitze fiel auf, dass es sich bei dem Stück um eine symbolische Dolchdarstellung handelt.

Bereits ein flüchtiger Blick in die gängige Literatur zu realen Aunjetitzer Dolchen (Seger 1936; Gandert 1938; Schwenzer 2004; Moucha 2005 *etc.*) bestätigte dies und zeigte, dass es sich bei den bisher als Schmuckschilden gedeuteten Bronzeanhängern oder Applikationen völlig zweifelsfrei um stilisierte

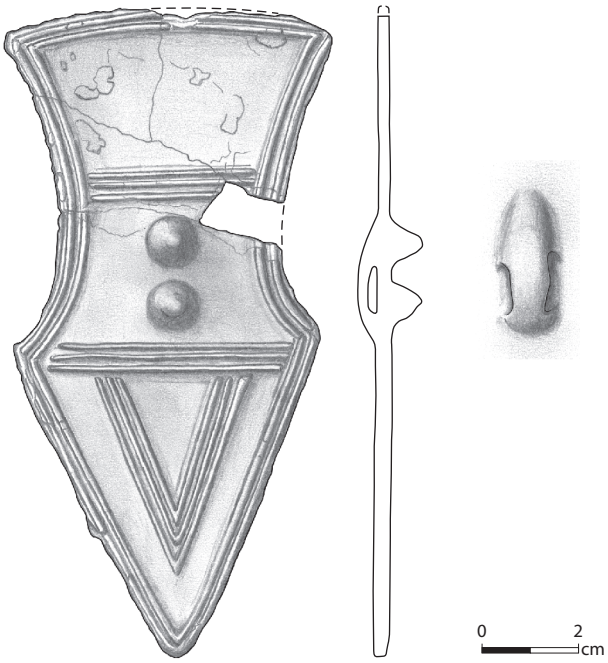

Abb. 1. Storkau, Lkr. Stendal. Der Neufund eines aus Bronze gegossenen Schmuckschildes war der Ausgangspunkt für die Neuinterpretation dieser Fundgruppe als Symboldolch (Zeichnung: Mario Wiegmann).

Darstellungen von Dolchen handelt. Beim Durchblättern des Tafelteils der enzyklopädischen Zusammenstellung der frühbronzezeitlichen Dolche durch Stefan Schwenzer (2004) fällt auf, dass ein ganz erheblicher Teil der Vollgriffdolche über eine Klingenverzierung aus hängenden Dreiecken, die häufig von schneidenparallelen Rillen eingefasst werden, verfügt; genau jene Zierelemente, treten auch auf Symboldolchen auf (vgl. Schwenzer 2004, 350–353, Listen 47–50). In den Hortfunden mit Dolchen finden sich häufiger Stücke mit randbegleitenden Rillen, und tatsächlich kommen auch an Symboldolchen ähnliche Verzierungen vor (Abb. 2, z. B. Bresinchen: Breddin 1969, 35 Abb. 14.2; Suchdol: Divac und Sedláček 1999, Taf. 10). Dies könnte ein Hinweis auf die Bedeutung der Verzierung zur Kennzeichnung von Eigenschaften oder sozialer Zugehörigkeit des Dolchträgers sein. Bei allen Typen von Symboldolchen wie auf Taf. 2.6, Taf. 3.7–10, Taf. 4.11–13 finden die v-förmigen Linienbündel ihren Abschluss in horizontalen Linien, die im Fall von Taf. 1.2–3 über hängende Wolfszahnmuster verfügen. Die charakteristische Verzierung aus Dreiecken ist für die klare Erkennbarkeit der Klinge als symbolische Form ideal geeignet. Die grafisch sehr einfache und klare Form besitzt einen hohen Wiedererkennungswert, zumindest für Angehörige eines Kulturkreises, in dem diese Zierform auf Metall grundlegend ist.

Am Beispiel von Storkau (vgl. Abb. 1) folgt — wie bei den Dolchvorbildern — nach der Klinge mit v-förmigen Rillen die Mittelzone des Griffes mit Heft und zwei übereinanderliegenden Nieten sowie der durch drei horizontale Linien getrennte Rest des Griffes mit Knauf.

Ein Blick auf reale Vollgriffdolche zeigt eindrucksvoll (vgl. Abb. 2), dass sich alle Elemente von der Klingenverzierung bis hin zur Griffform, aber selbst die übereinanderstehenden Nieten, in den realen Vorbildern finden, sodass eine bessere Stilisierung als bei den Symboldolchen, wie wir sie nun bezeichnen wollen, kaum möglich zu sein scheint. Betrachten wir nun alle bisher bekanntgewordenen Symboldolche, so lassen sich diese in vier Typen, die alle aus Bronze gefertigt sind, mit unterschiedlicher Chronologie und Verbreitung unterteilen (Abb. 3):

Typ 1 (Starý Bydzov) ist blechern mit zwei parallelen Befestigungsnieten, wohl einst auf Leder oder Stoff befestigt und weist eine kurze trianguläre Klinge mit randbegleitenden Seitenbändern und abschließenden hängenden Dreiecken auf. Die Form Starý Bydzov ist im dort entdeckten Hortfund mit Rudernadeln und einer Schmuckscheibe vergesellschaftet, die um 2000 v. Chr. zu datieren sind, der im Hortfund vorkommende massive Armring ist allerdings nach Ralf Schwarz (2021) erst in die Mitte des 20. Jhs. v. Chr. zu setzen.[3]

Typ 2 (Siedlce) von löffelartiger Form mit zwei vertikalen Nieten auf der „Klinge" datiert ebenfalls in die Stufe AK 2b nach Ralf Schwarz (2021), also an den Beginn des 20. Jhs. v. Chr.[4] Er weicht mit seinen ovalen „Klingen" am stärksten von den realen Vorbildern ab.

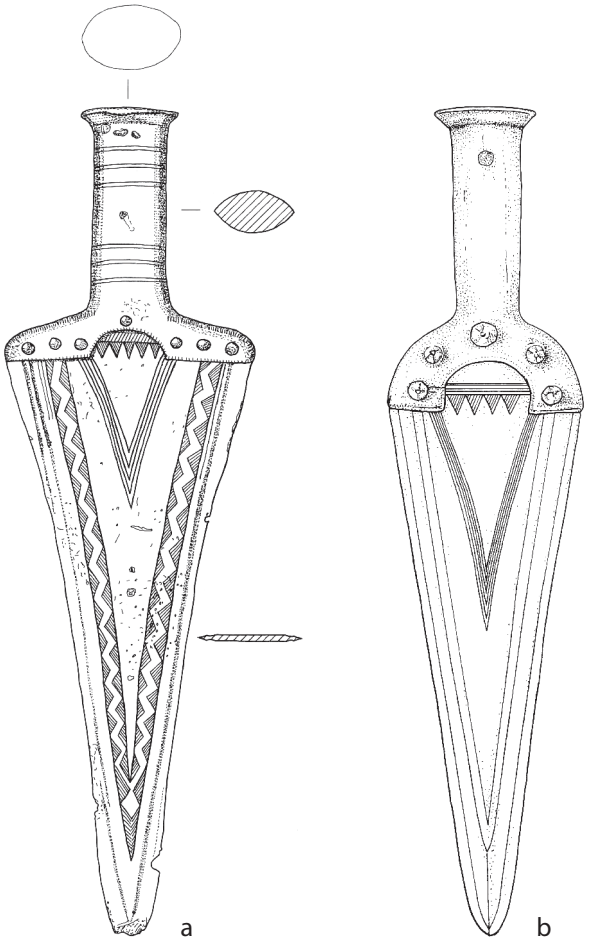

*Abb. 2. Dolche der Aunjetitzer Kultur, wie hier aus Bresinchen (**a**) und Suchdol (**b**), sind Vorbilder für die Symboldolche (Zeichnungen: **a** nach Breddin 1969, 35 Abb. 14.2; **b** nach Divac und Sedláček 1999, Taf. 4–9).*

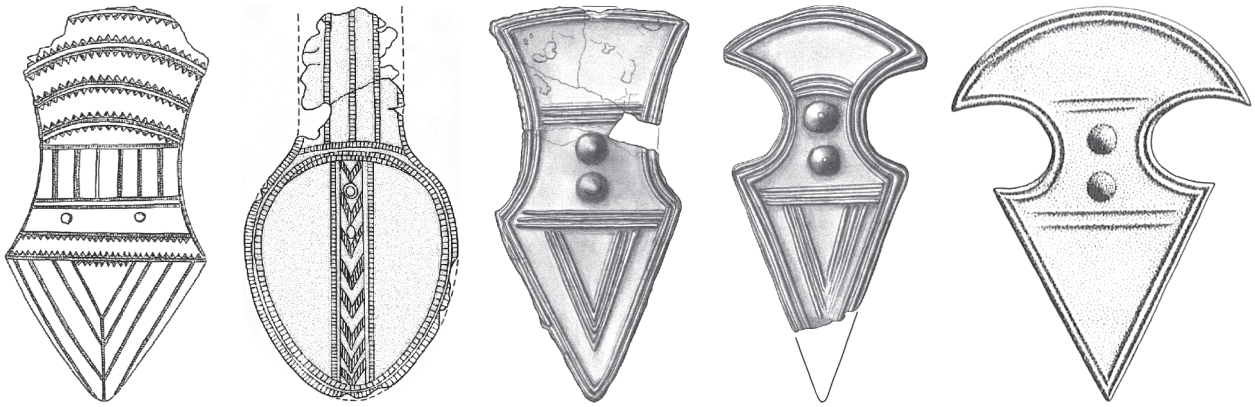

Abb. 3. Typen der Aunjetitzer Symboldolche. Die Typen 1 und 2 datieren an den Beginn bis in die Mitte des 20. Jahrhunderts v. Chr., Typ 3 zwischen 1900 und 1775 v. Chr. und Typ 4 von 1875–1750 v. Chr. (Zeichnungen: Typ 1: nach Moucha 2005, Taf. 96.1; Typ 2: nach Szpunar 1987, Taf. 47 B10; Typ 3: Mario Wiegmann; Typ 4: nach Gedl 1980, Taf. 27 D1).

Typ 3 (Storkau), der in seiner Musterung den Originalen am nächsten kommt, ist durch Fundvergesellschaftungen mit Randleistenbeilen, massiven Armringen, Halsringen mit Pfötchenenden und gerippten Manschetten in den Horten Klein Wesenberg, Gödau-Birkau und Falkenwalde in die Stufe AK 3b (nach Schwarz 2021), also zwischen 1900 und 1775 v. Chr. zu stellen. [5]

Typ 4 (Poniec), stark stilisiert mit halbkreisförmigem Knauf, wird aufgrund der Vergesellschaftung mit späten Dolchformen, in die späte Stufe AK 3b (nach Schwarz 2021), also zwischen 1875 und 1750 v. Chr. datiert. [6]

Dabei ist festzuhalten, dass der Typ 1 (Starý Bydzov) aus dem Kernbereich Böhmen und Mähren des Aunjetitzer Gebiets selbst stammt, über eine Niet- und keine Hängevorrichtung verfügt und es sich dabei gleichzeitig um die ältesten Stücke handelt, die mit den kurzen Klingen an Glockenbecherdolche erinnern (Abb. 4; Tabelle 3). Die „klassischen Stücke" folgen dem Typ 3 (Storkau) und sind außerhalb des Aunjetitzer Gebietes in der Region von Elbe und Havel verbreitet. Diese datieren jünger (19.–18. Jh. v. Chr.). Ihnen schließt sich der etwas jüngere, stärker stilisierte Typ 4 (Poniec) mit einer Verbreitung in der Lausitz und dem angrenzenden Niederschlesien an.

Es ist bemerkenswert, dass sich die Symboldolche der Typen 3 und 4 vereinzelt in Hortfunden (Falkenwalde und Poniec) zusammen mit echten Dolchen fanden. Dolche kommen im Aunjetitzer Gebiet auch in Fürstengräbern vor. Dies deutet darauf hin, dass es sich bei den Symboldolchen um ein klares Distinktionsmittel ohne praktischen Zweck, sondern mit Symbolwert zur Bezeichnung des Ranges handelt.

Da sich aber, wie beschrieben, auch reale Dolche in den Hortfunden befinden, wäre es gleichfalls möglich, dass sich hinter diesen Symboldolchen Frauen von äquivalentem Rang verbergen, die möglicherweise nicht mit realen Waffen ausgestattet waren. Dies wäre insofern von Bedeutung, als sich die Aunjetitzer Frauen bislang im zentralen Gebiet um den Harz der hierarchischen Einordnung, die bei den Männergräbern dort durch reiche Beigaben, darunter Dolche, möglich ist, entziehen. Da Hortfunde eine soziale Realität widerspiegeln (Meller 2013), könnte es sein, dass sich reiche Frauen in den Gräbern aufgrund spezieller Beigabensitten unserer Detektion entziehen, aber in den Hortfunden, etwa über Bernsteinschmuck (Meller 2022) oder die Symboldolche, sichtbar werden.

Ein gutes Beispiel aus der südenglischen, mit der Aunjetitzer Kultur in Beziehung stehenden Wessex-Kultur sind die dortigen Miniaturdolche und Stabdolche, die Frauengräber wie Manton Barrow, Preshute G1a (Annable und Simpson 1964, 101 Nr. 200; Woodward und Hunter 2015, 449 Abb. 8.5.1.; Maraszek 2020, 60 Abb. 1) oder Wilsford G8, beide Wiltshire (Großbritannien; Annable und Simpson 1964, 100 Nr. 180; Woodward und Hunter 2015, 196 Abb. 5.9, 1; 451 Abb. 8.5, 2; Maraszek 2020, 62 Abb. 2–3), kennzeichnen.

Ein Blick auf die Verbreitungskarte von Dolchen und Symboldolchen ermöglicht jedoch auch eine andere Interpretation (Abb. 5). Nachdem die ranganzeigenden Symboldolche im Aunjetitzer Kerngebiet Böhmen und Mähren als Idee in der Mitte des 20. Jhs. v. Chr. entstanden waren, verbreiteten sie sich entlang der Elbe, in einer den realen Dolchen optisch nahekommenden Form (Typ 3); einige wenige spätere Exemplare (Typ 4) breiteten sich nach Osten aus (Abb. 4–5). Nachdem der Idee „Symboldolch" im Kerngebiet möglicherweise wenig Erfolg beschieden war und dort die realen Dolche beibehalten wurden, kamen die Stücke des Typs 3 an mittlerer und niederer Elbe in einem Raum unmittelbar nördlich der Aunjetitzer Kultur vor, in dem der Brauch Dolche in klassischen Horten niederzulegen regional aussetzt. Es könnte sein, dass die Symboldolche dort in der Deponierungssitte anstelle von realen Dolchen niedergelegt worden sind. So füllen die Symboldolche eine Verbreitungslücke der realen Stücke und zeigen einmal mehr, dass die Distinktionsmittel der Frühbronzezeit

3 Zu den wichtigsten Fundnennungen des Typs 1 siehe Bartelheim 1998, 238 Nr. 88a; Moucha 2005, 136 Nr. 143; Taf. 60; Jiráň u. a. 2008, 57 Abb. 29.2; Vachta 2016, 229; 272 Tab. 16; 292; Bartík und Zachar 2017, 66 Abb. 4.2; 77–78.

4 Zu den wichtigsten Fundnennungen des Typs 2 siehe z. B. Reinecke 1902, 118 Abb. 93; 118–119; Seger 1924, 78 Abb. 45; 78 Abb. 45; 78–79; Kossinna 1928, 279–280; Bohm 1935, 24; Seger 1936, 101–103; 101 Abb. 16; Gandert 1938, 45; 50 Abb. 1; Taf. 8.2; Sarnowską 1969, 104; 287; 286 Abb. 118a; Blajer und Szpunar 1981, 299–300 Abb. 3; Szpunar 1987, 32–33; Taf. 47 B10; Blajer 1990, 132–133 Nr. 109; Taf. 97.2; Zich 1996, 581 Nr. R91; Bartík und Zachar 2017, 66 Abb. 4.3; 77–78.

5 Zu den wichtigsten Erwähnungen des Typs 3 s. Kossinna 1928, 279–280; Engel 1930, 206; 223 Abb. 126v; Redlich 1934, 64–70; Taf. 8.6–8; Gandert 1938, 48–49; 50 Abb. 1; Taf. 8.4; Taf. 9 a, c–e; Hachmann 1957, 72; 120; 149; 193 Nr. 194; 200 Nr. 316; Taf. 30.9–11; 202 Nr. 355; Taf. 43.8–10; Zich 1996, 368 Nr. B18; 376 Nr. C20; Laux 2017, 115 Nr. 77.8; Taf. 10.1–3.

6 Zu den wichtigsten Nennungen des Typs 4 siehe u. a. Kossinna 1902, 193; Reinecke 1902a, 19; Kostrzewski 1924, 167 Abb. 27; 168; Seger 1924, 78 Abb. 49; 79; Kossinna 1928, 279–280; von der Hagen 1928, 362; Rajewski 1932, 119 Abb. 3; Redlich 1934, 65; Bohm 1935, 25; Knapowska-Mikołajczykowa 1957, 70; 71 Abb. 81c; Kostrzewski u. a. 1965, 124; 126 Abb. 26.8; Sarnowską 1969, 195–196 Abb. 63; Gedl 1980, 12–13; 41–42; Taf. 27 D1; Blajer 1990, 125–126 Nr. 90; Taf. 76,1; Zich 1996, 572 Nr. Q95; Bartík und Zachar 2017, 66, Abb. 4.5; 77–78.

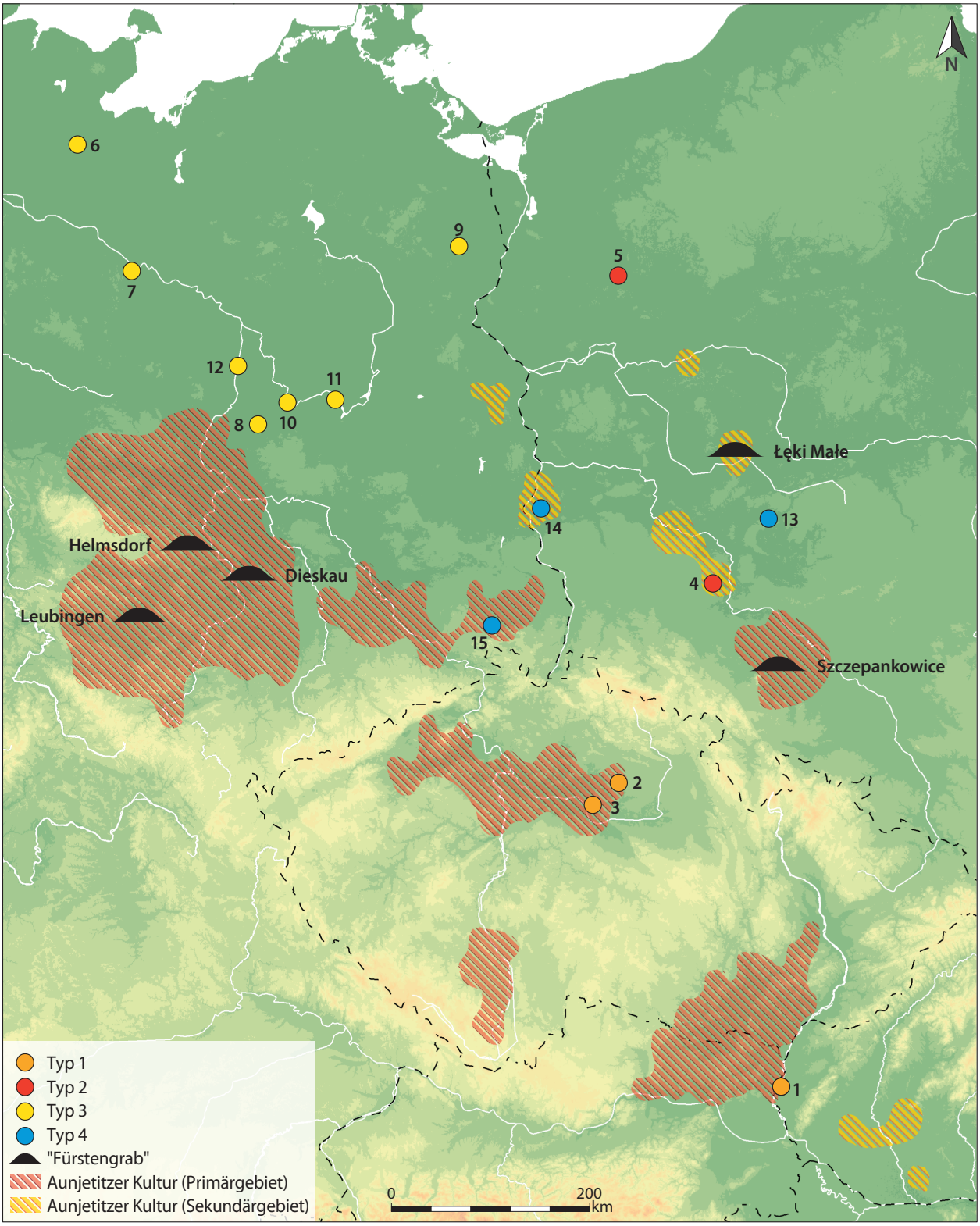

Abb. 4. Verbreitung der Symboldolche und ihre Lage im Verhältnis zum Gebiet der Aunjetitzer Kultur. Die Nummerierung entspricht den Nummern auf den Tafeln (Karte: Anna Swieder; Verbreitung Aunjetitzer Kultur nach Zich 1996, Karte 1; Jiráň u. a. 2008, 22 Abb. 6; Peška 2009, Karte 1; Risch et al. 2021, 14 Abb. 2b; Kartengrundlage: „version 3" basierend auf 3 arc second SRTM V2, zur Verfügung gestellt vom International Center for Tropical Agriculture (CIAT) Land Use Project, mit frdl. Genehmigung des U.S. Geological Survey (USGS) und der National Aeronautics and Space Administration (NASA), public domain; Gewässer/ Ländergrenzen erstellt mit Natural Earth, freie Vektor- und Raster-Kartendaten @ naturalearthdata.com; Gewässer (WISE) mit frdl. Genehmigung der European Environment Agency (EEA), Lizenz CC-BY 4.0).

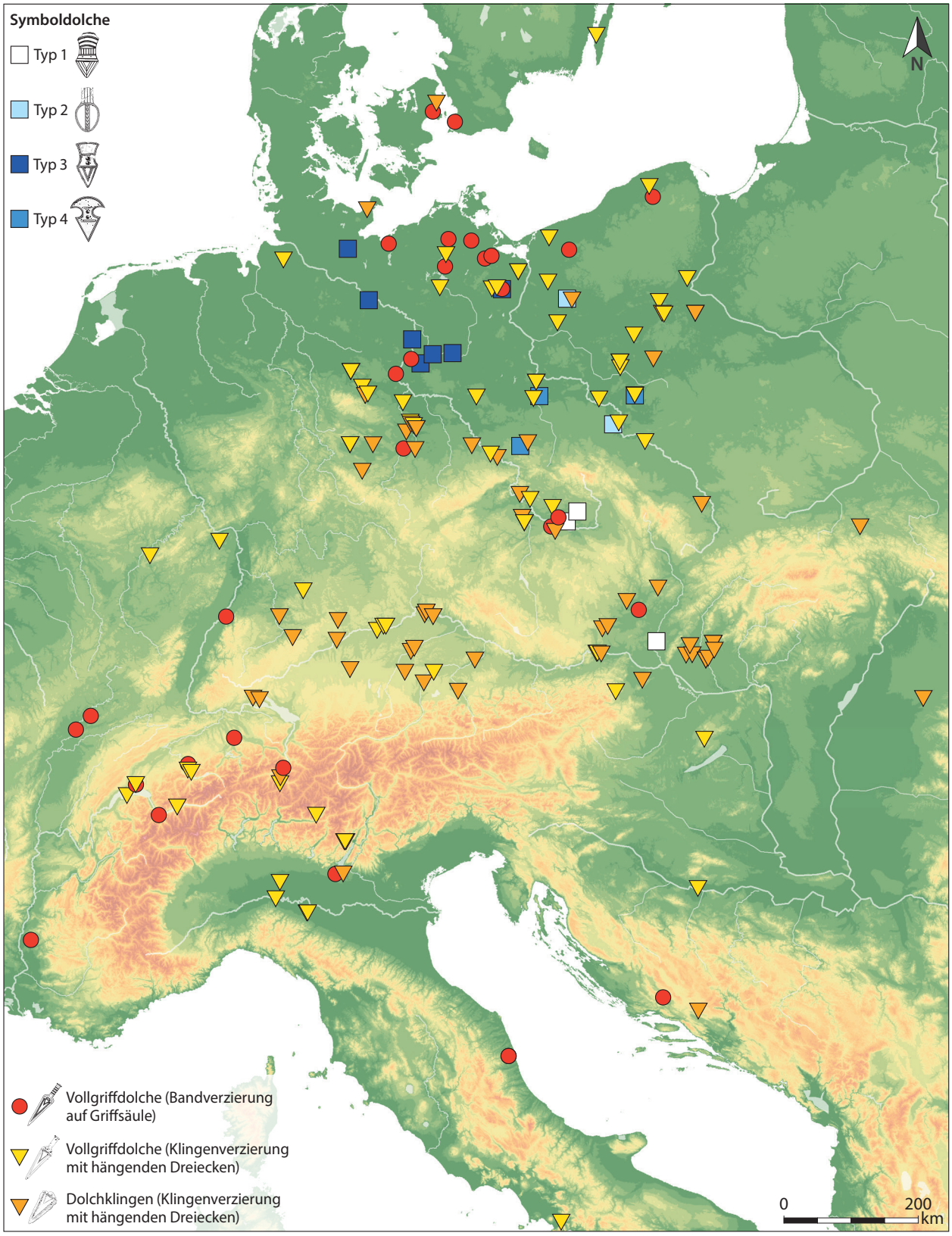

Abb. 5. Verbreitung der Symboldolche im Verhältnis zu den in ihrer Verzierung ähnlichen Vollgriffdolchen und Dolchklingen der Frühbronzezeit in Europa. Besonders auffällig ist, dass sich Typ 3 nur geringfügig mit der Verbreitung der realen Dolche überschneidet (Zeichnungen nach Breddin 1969, 35 Abb. 14.2; Divac und Sedláček 1999, Taf. 10; Maier 1972, 236 Abb. 1.1a; Moucha 2005, Taf. 96.1; Szpunar 1987, Taf. 47 B10; Mario Wiegmann; Gedl 1980, Taf. 27 D1; Kartierung: nach Schwenzer 2004, 350–353 Listen 47–50; Karte: siehe Abb. 4 nach Entwurf von Florian Michel).

Tabelle 3 (Doppelseite). Liste aller in Abb. 5 kartierten Vollgriffdolche und Dolchklingen (Tabelle: Florian Michel, nach Schwenzer 2004, 350–353).

Vollgriffdolche (Bandverzierung auf Griffsäule)			Vollgriffdolche (Klingenverzierung mit hängenden Dreiecken)		
Ort	**Gebietskörperschaft**	**Staat**	**Ort**	**Gebietskörperschaft**	**Staat**
Baalberge	Salzlandkreis	D	**Dettum**	Wolfenbüttel	D
Piattamala	Sondorino	I	**Melz**	Mecklenburgische-Seenplatte	D
Granches	Wallis	CH	**Granowo**	Woj. wielkopolskie	PL
Lausanne	Lausanne	CH	**Lago di Ledro**	Trento	I
Sigriswil-Ringoldswil	Bern	CH	**Kotla**	Woj. dolnośląskie	PL
Thun-Renzenbühl	Bern	CH	**Wilczkowo**	Woj. zachodniopomorskie	PL
Szentgál	Vezprem	HU	**Castione die Marchesi**	Parma	I
Bollensdorf	Teltow-Fläming	D	**Naundorf**	Spree-Neiße	D
Bresinchen	Spree-Neiße	D	**Döttingen**	Schwäbisch-Hall	D
Fraham	Mühldorf am Inn	D	**Halle-Kanena**	Halle	D
Lamstedt	Cuxhaven	D	**Parpanese**	Pavia	I
Lodi	Lodi (Lombardei)	I	**Kłodawa**	Woj. lubuskie	PL
Dobrcz	Woj. kujawsko-pomorskie	PL	**Malchin**	Mecklenburgische-Seenplatte	D
Huy-Neinstedt	Harz	D	**Neunheilingen**	Unstrut-Hainich-Kreis	D
Ingolstadt	Ingolstadt	D	**Zell**	Neuburg-Schrobenhausen	D
Granowo	Woj. wielkopolskie	PL	**Tworkowo**	Woj. wielkopolskie	PL
Dobra	Woj. wielkopolskie	PL	**Horoměřice**	Praha-západ	CZ
Wrocław-Pilczyce	Wrocław	PL	**Luštěnice**	Mladá Boleslav	CZ
Thon-les-Bains	Haute-Savoie	F	**Vokna**	Litoměřice	CZ
Donja Dolina	Republika Srpska	BIH	**Dresden-Briesnitz**	Dresden	D
Schmachtenhagen	Uckermark	D	**Dobra**	Woj. wielkopolskie	PL
Tarentaise	Haute-Savoie	F	**Świątkowo**	Woj. kujawsko-pomorskie	PL
Karlevi	Öland	S	**Wojcieszyn**	Woj. kujawsko-pomorskie	PL
Donath	Graubünden	CH	**Bresinchen**	Spree-Neiße	D
Horoměřice	Praha-západ	CZ	**Ingolstadt**	Ingolstadt	D
Halberstadt	Harz	D	**Magnushof**	Uckermark	D
Castione die Marchesi	Parma	I	**Stargard Szczeciński**	Woj. zachodniopomorskie	PL
Lago di ledro	Trento	I	**Halle-Giebichenstein**	Halle	D
Gau-Bickelheim	Alzey-Worms	D	**Łęki Małe**	Woj. lubuskie	PL
Ścinawa	Woj. dolnośląski	PL	**Rzechcino**	Woj. pomorskie	PL
Poniec	Woj. wielkopolskie	PL	**Franzhausen**	Niederösterreich	AUT
Trassem	Trier-Saarburg	D			
Maiersdorf	Niederösterreich	AUT			
Tupadly	Melnik	CZ			
Nocera dei Pagani	Salerno	I			

noch Überraschungen bereithalten (vgl. Meller 2024). Damit wäre zwar der Ursprung der Symboldolche eine Aunjetitzer Erfindung, nicht aber die weniger detailliert anmutenden Typen 3 und 4, die über eine wesentlich veränderte flexiblere Aufhängung und mit gegossenen Ösen verfügten.

Abschließend lässt sich feststellen, dass Forschungen und Überlegungen zum Sehen von Artefakten nicht nur wichtig sind, sondern bereits beim Fundeingang im Museum beginnen können, da uns der unbefangene Blick häufig schon durch unsere akademische Vorprägung verstellt ist.

Nachtrag

Nach Abschluss des Manuskriptes veröffentlichten Michal Erneé *et al.* (2024) mit einem Neufund aus Tursko, Böhmen, ebenfalls eine aktuelle Sammlung mit vergleichbarer Typengliederung (ebd., 123–136). Bezeichnet wurden die Objekte hier als *„tongue-shaped sheet metal“*, wohl weil die Symboldolche mit jeweils zwei runden Schmuckscheiben zusammen gesehen wurden. Die Stücke, Typ 1 nach der hiesigen Klassifizierung, konnten für den vorliegenden Beitrag nicht mehr berücksichtigt werden.

Dolchklingen (Klingenverzierung mit hängenden Dreiecken)					
Ort	**Gebietskörperschaft**	**Staat**	**Ort**	**Gebietskörperschaft**	**Staat**
Vinjani na Sopi	West-Herzegowina	BIH	**Halle**	Halle	D
Christiansholm Mose	Kopenhagen	DK	**Langenpreising-Steingrub**	Erding	D
Abtsdorf-Brünnthal	Bertesgadener Land	D	**Langenstein**	Harz	D
Aham	Rosenheim	D	**Lauingen**	Dillingen an der Donau	D
Aigen-Riedenburger Forst	Passau	D	**Leubingen**	Sömmerda	D
Anzing	Ebersberg	D	**Mintraching**	Regensburg	D
Dettum	Wolfenbüttel	D	**Mötzing**	regensburg	D
Dieskau	Saalekreis	D	**Nähermemmingen**	Donau-Ries	D
Eching-Haunwang	Landshut	D	**Neunheilingen**	Unstrut-Hainich-Kreis	D
Hepsisau	Esslingen	D	**Neuratjensdorf**	Ostholstein	D
Neunheilingen	Unstrut-Hainich-Kreis	D	**Radolfszell**	Konstanz	D
Remseck-Aldingen	Ludwigsburg	D	**Singen**	Konstanz	D
Schwabmünchen	Augsburg	D	**Wauden**	Meißen	D
Peschiera del Garda	Verona	I	**Werschen-Oberwerschen**	Burgenlandkreis	D
Gemeinlebarn	Niederösterreich	AUT	**Lago di Ledro**	Trento	I
Limberg	Niederösterreich	AUT	**Franzhausen**	Niederösterreich	AUT
Biecz	Woj. małopolskie	PL	**Roggendorf**	Niederösterreich	AUT
Granowo	Woj. wielkopolskie	PL	**Zellerndorf**	Niederösterreich	AUT
Inowrocław	Woj. kujawsko-pomorskie	PL	**Granowo**	Woj. wielkopolskie	PL
Objezierze	Woj. lubuskie	PL	**Inowrocław**	Woj. kujawsko-pomorskie	PL
Pawłowiczki	Woj. opolskie	PL	**Juncewo**	Woj. kujawsko-pomorskie	PL
Środa Wielkopolska	Woj. wielkopolskie	PL	**Poniec**	Woj. wielkopolskie	PL
Săcueni	Bihor	RO	**Cazis Cresta**	Graubünden	CH
Jelšovce	Nitra	SK	**Abrahám**	Galanta	SK
Šal'a Veča	Galanta	SK	**Jelšovce**	Nitra	SK
Trnava	Trnava	SK	**Nitra-Černáň**	Nitra	SK
Velký	Galanta	SK	**Šal'a-Dusikáreň**	Galanta	SK
Polepy	Litoměřice	CZ	**Šal'a Veča**	Galanta	SK
Altegolfsheim	Regensburg	D	**Holubice**	Praha-západ	CZ
Arnstadt	Ilm-Kreis	D	**Horoměřice**	Praha-západ	CZ
Burgstadten	Saalekreis	D	**Kojátky**	Vyškov	CZ
Burk	Bautzen	D	**Kouřim**	Kolín	CZ
Dettum	Wolfenbüttel	D	**Vedrovice-Zábrdovice**	Znojmo	CZ
Dieskau	Saalekreis	D	**Vokna**	Litomeřice	CZ
Dresden-Dobritz	Dresden	D			

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LITERATUR

Alais, D. und Blake, R., Hrsg. 2005. *Binocular Rivalry*. Cambridge: MIT Press.

Annable, F.K. und Simpson, D.D.A., 1964. *Guide Catalogue of the Neolithic and Bronze Age Collections in Devizes Museum*. Devizes: Wiltshire Archaeological and natural history society.

Bartík, J. und Zachar, T., 2017. Ozdobný štít Únětickej kultúry z Gajar. *Annales Musei Nationalis Slovaci Archeológia* 27, 63–79.

Bartelheim, M., 1998. *Studien zur böhmischen Aunjetitzer Kultur. Chronologische und chorologische Untersuchungen*, Universitätsforschungen zur prähistorischen Archäologie 46. Bonn: Habelt.

Billig, G., 1958. *Die Aunjetitzer Kultur in Sachsen. Katalog*, Veröffentlichungen des Landesmuseums für Vorgeschichte Dresden 7. Leipzig: Deutscher Verlag d. Wissenschaften.

Blajer, W., 1990. *Skarby z wczesnej epoki brązu na Ziemiach Polskich*, Prace Komisji Archeologicznej 28. Wrocław: Zakład Narodowy Imienia Ossolińskich.

Blajer, W. und Szpunar, A., 1981. O możliwościach wydzielania horyzontów skarbów brązowych na obszarze polski. *Archeologia Polski* 26, 295–320.

Bohm, W., 1935. *Die ältere Bronzezeit in der Mark Brandenburg*. Berlin: de Gruyter.

Böttcher, H., 1893. Vorgeschichtliche Funde aus der Standesherrschaft Forst-Pförten. *Niederlausitzer Mitteilungen* 3(1), 34–54.

Breddin, R., 1969. Der Aunjetitzer Bronzehortfund von Bresinchen, Kr. Guben. *Veröffentlichungen des Museums für Ur- und Frühgeschichte Potsdam* 5, 15–56.

Divac, G. und Sedláček, Z., 1999. *Hortfunde der altbronzezeitlichen Dolche von Praha 6-Suchdol*, Fontes Archaeologici Pragenses Suppl. 1. Prag: Museum Nationale Prag.

Engel, C., 1930. *Bilder aus der Vorzeit an der mittleren Elbe. Ein Heimat- und Volksbuch für den Regierungsbezirk Magdeburg und seine Grenzlandschaften. Erster Band. Steinzeit und Bronzezeit*. Burg: August Hopfer.

Erneé, M., Smejtek, L., Kmošek, J., Daněček, D., Fikrle, M., Kočergina, J.E., Cibulka, D. und Vlach, M., 2024. *Tursko. Depot starší doby bronzové ze středních Čech. An Early Bronze Age Hoard from Central Bohemia*, Památky archeologické Suppl. 22. Praha: Archeologický ústav AV ČR.

Frenzel, J.H., 1925. Der Bronzesammelfund von Birkau. *Bautzner Geschichtshefte* 3(1), 208–212.

Frenzel, J.H., 1926. Die bronzezeitlichen Sammel- und Einzelfunde der Oberlausitz. *In:* W. Frenzel, Hrsg. *Festschrift zur 25-Jahrfeier der Gesellschaft für Vorgeschichte u. Geschichte der Oberlausitz zu Bautzen*. Bautzen: Gebr. Müller.

Gandert, O.-F., 1938. Neue Schmuckschilde der frühen Bronzezeit. *Elbinger Jahrbuch* 15, 45–51.

Gandert, O.-F., 1957. Der Hortfund von Berlin-Lichtenrade und die nördliche Verbreitung der Aunjetitzer Kultur. *Jahrbuch des Römisch-Germanischen Zentralmuseums Mainz* 4, 23–62.

Gedl, M., 1980. *Die Dolche und Stabdolche in Polen*, Prähistorische Bronzefunde 6(4). München: C.H. Beck'sche Verlagsbuchhandlung.

Hachmann, R., 1957. *Die frühe Bronzezeit im westlichen Ostseegebiet und ihre mittel- und südosteuropäischen Beziehungen. Chronologische Untersuchungen*, Beihefte zum Atlas der Urgeschichte 6. Hamburg: Flemming.

Hofmann, A. und Nowakowski, W., Hrsg., 2022. *Die archäologischen Funde aus Polen und dem Baltikum im Germanischen Nationalmuseum. Gedenkschrift für Wilfried Menghin*, Wissenschaftliche Beibände zum Anzeiger des Germanischen Nationalmuseums 45. Nürnberg: Germanisches National Museum.

Jacob-Friesen, K.H., 1963. *Einführung in Niedersachsens Urgeschichte. II. Teil. Bronzezeit*, Veröffentlichungen der Urgeschichtlichen Sammlung des Landesmuseums Hannover 15(2). Hildesheim: August Lax.

Jiráň, L., Čujanová-Jílková E., Hrala, J., Hůrková, J., Chvojka, O., Koutecký, D., Michálek, J., Moucha, V., Pleinerová, I., Smrž, Z. und Vokolek, V., Hrsg., 2008. *Doba Bronzová*, Archeologie Pravěkých Čech 5. Praha: Archeologický ústav AV ČR.

Koch, H.-G., Müller, H.-G. und Pasley, M., 1990. *Franz Kafka. Kritische Ausgabe*. Tagebücher. Frankfurt am Main: S. Fischer.

Kersten, K., 1936. *Zur älteren nordischen Bronzezeit*. Neumünster: Wachholtz.

Kersten, K., 1951. *Vorgeschichte des Kreises Herzogtum Lauenburg*, Vor- und frühgeschichtliche Denkmäler und Funde in Schleswig-Holstein 2. Neumünster: Wachholtz.

Knapowska-Mikołajczykowa, A., 1957. Wczesny okres epoki brązu w Wielkopolsce. *Fontes Archaeologici Posnaniensi* 7, 31–115.

Koehler, K. und Erzepki, B., Hrsg., 1893. *Album der im Museum der Posener Gesellschaft der Freunde der Wissenschaften aufbewahrten Praehistorischen Denkmäler des Grossherzogthums Posen*. Heft I. Posen: Museum Posen.

Kossinna, G., 1902. Die indogermanische Frage archäologisch beantwortet. *Zeitschrift für Ethnologie* 34, 161–222.

Kossinna, G., 1928. Beiträge zur Bronzezeit im mittleren Elbegebiet. *In:* A. Mertens, Hrsg. *Festschrift zur 10. Jahrestagung der Gesellschaft für deutsche Vorgeschichte am 1.–7. September 1928*, Abhandlungen und Berichte aus dem Museum für Natur- und Heimatkunde und dem Naturwissenschaftlichen Verein in Magdeburg 5. Magdeburg: Museum für Natur- und Heimatkunde Magdeburg, 263–296.

Kostrzewski, J., 1924. Z badań nad osadnictwem wczenej i środkowej epoki bronzowej na ziemiach polskich. *Przegląd archeologiczny* 2(2), 161–218.

Kostrzewski, J., Chmielewski, W. und Jażdżewski, K., 1965. Pradzieje Polski. Wrocław: Zakład Narodowy im. Ossolińskich Wydawn.

Laux, F., 2000. *Die Äxte und Beile in Niedersachsen I (Flach-, Randleisten- und Absatzbeile)*, Prähistorische Bronzefunde 9(23), Stuttgart: Franz Steiner Verlag.

Laux, F., 2005. Ein seit langer Zeit bekannter, aber dennoch unbekannter Hortfund aus dem Landkreis Lüneburg. *Die Kunde N.F.* 56, 107–117.

Laux, F., 2017. *Bronzezeitliche Hortfunde in Niedersachsen*, Matherialhefte zur Ur- und Frühgeschichte Niedersachsens 51. Rahden/Westfalen: Verlag Marie Leidorf.

Maraszek, R., 2020. First Ladies. Gräber vornehmer Damen in England 2500–1600 v. Chr. *In:* H. Meller und M. Schefzik, Hrsg. *Die Welt der Himmelsscheibe von Nebra – Neue Horizonte. Begleitband zur Sonderausstellung im Landesmuseum für Vorgeschichte Halle (Saale) 4. Juni 2021 bis 9. Januar 2022*. Halle (Saale): wbg Theiss, 60–63.

Maier, R.A., 1972. Ein frühbronzezeitlicher Grabdolch mit Griffknauf. *Germania* 50, 235–237.

Meller, H., 2013. Der Hortfund von Nebra im Spiegel frühbronzezeitlicher Deponierungssitten. *In:* H. Meller, F. Bertemes, H.-R. Bork und R. Risch, Hrsg. *1600 – Kultureller Umbruch im Schatten des Thera-Ausbruchs? 4. Mitteldeutscher Archäologentag vom 14. bis 16. Oktober 2011 in Halle (Saale),* Tagungen des Landesmuseums für Vorgeschichte Halle 9. Halle (Saale): Landesamt für Denkmalpflege und Archäologie Sachsen-Anhalt, Landesmuseum für Vorgeschichte, 493–526.

Meller, H., 2022. Frauenpower – Bernsteincolliers als weibliches Machtsymbol. *In:* H. Meller und K. Gärtner, Hrsg. *Schönheit, Macht und Tod II. 275 Funde aus dem Landesmuseum für Vorgeschichte Halle. Band 1 Paläolithikum bis Eisenzeit*. Halle (Saale): Landesamt für Denkmalpflege und Archäologie Sachsen-Anhalt, Landesmuseum für Vorgeschichte, 234–237.

Meller, H., 2024. „Gewehre" für die Barbaren? Der frühbronzezeitliche Hortfund von Welbsleben neu betrachtet. *In:* J. Schneeweiß, M. Nawroth, H. Piezonka und H. Schwarzberg, Hrsg. *Man sieht nur, was man weiß. Man weiß nur, was man sieht. Globalhistorische Perspektiven auf interkulturelle Phänomene der Mobilität. Festschrift für Hermann Parzinger zum 65. Geburtstag,* Prähistorische Archäologie in Südosteuropa 33. Rahden/Westfalen: Verlag Marie Leidorf, 667–684.

Mertins, O., 1896. Depotfunde der Bronzezeit in Schlesien. *Schlesiens Vorzeit in Bild und Schrift* 6, 291–384.

Mertins, O., 1899. Kupfer- und Bronzefunde in Schlesien. *Schlesiens Vorzeit in Bild und Schrift* 7, 341–365.

Metzler, A., 1991. Hitzacker (Marwedel) DAN. *In:* H.-J. Häßler, Hrsg. *Ur- und Frühgeschichte in Niedersachsen*. Stuttgart: Theiss, 454.

Montelius, O., 1900. *Die Chronologie der ältesten Bronzezeit in Nord-Deutschland und Skandinavien*. Sonderdruck aus: Archiv für Anthropologie 25/26.

Moucha, V., 2005. *Hortfunde der frühen Bronzezeit in Böhmen*. Praha: Archeologický ústav AV ČR.

Müller, J., 1864. 1. Funde von Alterthümern. *Zeitschrift des Historischen Vereins für Niedersachsen* 29, 377–383.

Otto, H. und Winter, W., 1952. *Handbuch der ältesten vorgeschichtlichen Metallurgie in Mitteleuropa*. Leipzig: Barth.

Peška, J., 2009. *Protoúnětické pohřebiště z Pavlova*. Olomouc: Vlastivědné muzeum.

Petsch, H., 1940. *Die ältere Bronzezeit in Mitteldeutschland.* Bona: Noske.

Rajewski, Z.A., 1932. Powiat gostyński w czasach przedhistorycznych. *Kronika Gostyńska* 4(8), 113–128.

Redlich, C., 1934. Die Depotfunde der älteren und mittleren Bronzezeit im Landesmuseum Hannover. *Nachrichten aus Niedersachsens Urgeschichte* 8, 63–77.

Reichel, M., 2000. *Die archäologischen Funde der Lausitzer Kultur im Germanischen Nationalmuseum*, Wissenschaftliche Beibände zum Anzeiger des Germanischen Nationalmuseums 16. Nürnberg: Germanisches Nationalmuseum.

Reinecke, P., 1902. Beiträge zur Kenntnis der frühen Bronzezeit Mitteleuropas. *Mitteilungen der Anthropologischen Gesellschaft in Wien* 32, 104–129.

Risch, R., Friederich, S., Küßner, M. und Meller, H., 2021. Die Entwicklung und Struktur des Siedlungswesens zwischen dem Endneolithikum und der frühen Bronzezeit in Mitteleuropa. *In:* H. Meller, S. Friederich, M. Küßner, H. Stäuble und R. Risch, Hrsg. *Siedlungsarchäologie des Endneolithikums und der frühen Bronzezeit. 11. Mitteldeutscher Archäologentag vom 18. bis 20. Oktober 2018 in Halle (Saale),* Tagungen des Landesmuseums für Vorgeschichte Halle 20(3). Halle (Saale): Landesamt für Denkmalpflege und Archäologie Sachsen-Anhalt, Landesmuseum für Vorgeschichte, 11–35.

Rzehak, A. und Červinka, I.L., 1925. Aunjetitzer Kultur. *In:* M. Ebert, Hrsg. *Reallexikon der Vorgeschichte* 2. Berlin: de Gruyter, 72–82.

Sarnowska, W., 1969. *Kultura unietycka w Polsce*. Wrocław: Muzeum Archeologiczne we Wrocławiu.

Schwantes, G., 1939. *Die Vorgeschichte Schleswig-Holsteins (Stein- und Bronzezeit) 1*. Neumünster: Karl Wachholtz.

Schwarz, R., 2021. *Typentafeln zur Chronologie in Mitteldeutschland – Die Aunjetitzer Kultur auf Grundlage der Grab- und Siedlungskeramik*, Forschungsberichte des Landesmuseums für Vorgeschichte Halle 19. Halle (Saale): Landesamt für Denkmalpflege und Archäologie Sachsen-Anhalt, Landesmuseum für Vorgeschichte.

Schwenzer, S., 2004. *Frühbronzezeitliche Vollgriffdolche. Typologische, chronologische und technische Studien auf der Grundlage einer Materialaufnahme von Hans-Jürgen Hundt*. Mainz: Verlag des Römisch-Germanischen Zentralmuseums.

Seger, H., 1924. Schmuckschilde der frühen Bronzezeit. *Altschlesien* 1(2), 76–80.

Seger, H., 1936. Schlesische Hortfunde aus der Bronze- und frühen Eisenzeit. *Altschlesien* 6(1), 85–182.

Szpunar, A., 1987. *Die Beile in Polen I (Flachbeile, Randleistenbeile, Randleistenmeißel)*, Prähistorische Bronzefunde 9(16). München: C.H. Beck.

Vachta, T., 2016. *Bronzezeitliche Hortfunde und ihre Fundorte in Böhmen*, Berlin Studies of the Ancient World 33. Berlin: Edition Topoi.

Vogeler, O., 1939. Die Bronzezeit im Gebiet zwischen Elbe und Havel. *Volkstum und Heimat* 27, 57–61.

von Brunn, W.A., 1959. *Die Hortfunde der frühen Bronzezeit aus Sachsen-Anhalt, Sachsen und Thüringen*, Schriften der Sektion für Vor- und Frühgeschichte 7(1). Berlin: Akademie Verlag.

von der Hagen, J.O., 1926. Der Depotfund von Falkenwalde in der Uckermark. *Mannus* 18, 358–364.

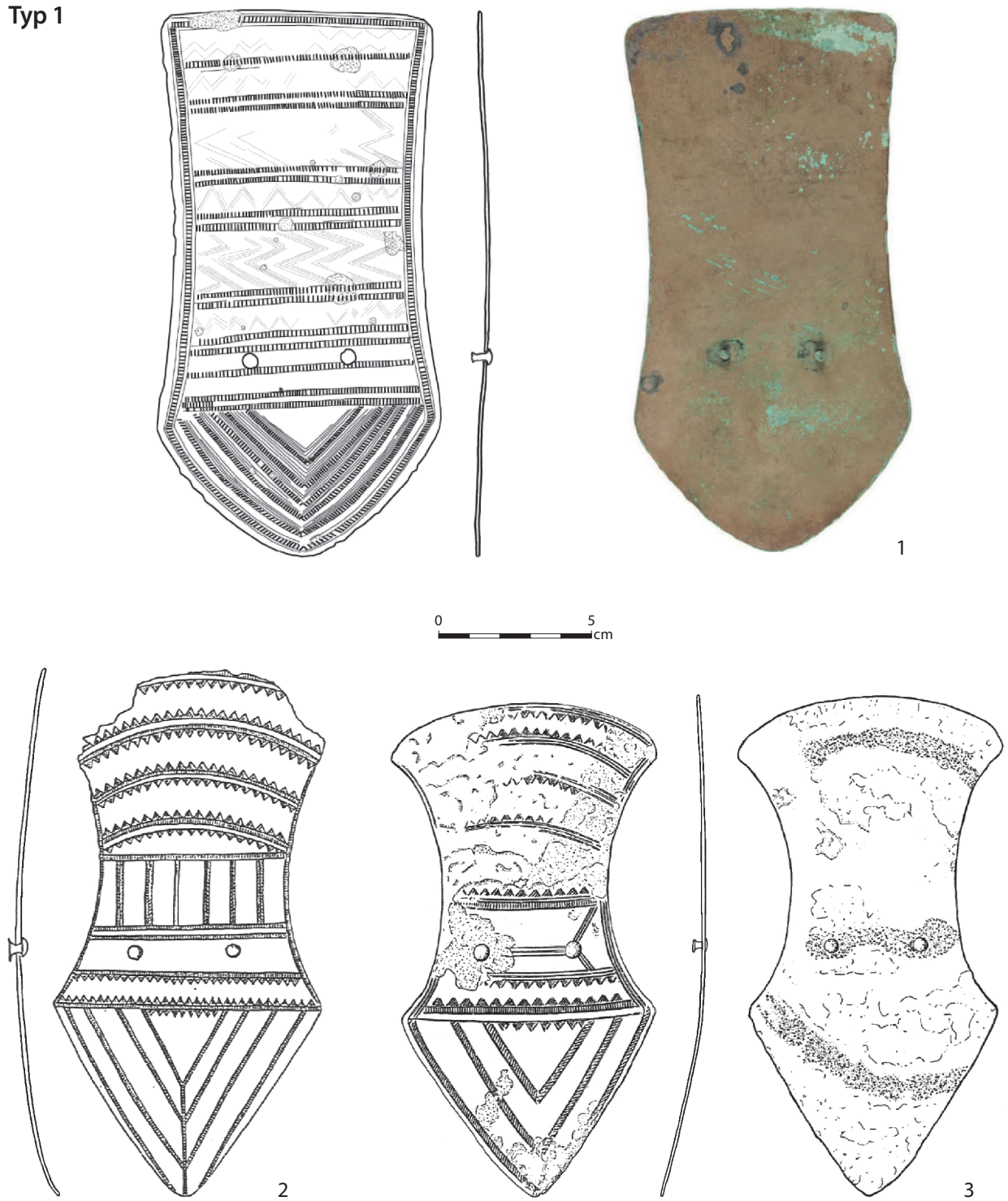
von Wechmar, 1854. Ueber die Technik der Bewohner Schlesiens im Alterthum. *Jahresbericht der Schlesischen Gesellschaft für Vaterländische Kultur* 32, 52–56. https://www.biodiversitylibrary.org/item/118502#page/58/mode/1up

Witter, W., 1938. *Die älteste Erzgewinnung im nordisch-germanischen Lebenskreis. Band I. Die Ausbeutung der mitteldeutschen Erzlagerstätten in der frühen Metallzeit*, Mannus-Bücherei 60. Leipzig: Curt Rabitzsch.

Woodhward, A. und Hunter, J., 2015. *Ritual in early Bronze Age grave goods. An examination of ritual and dress equipment from chalcolithic and Early Bronze Age graves in England*. Oxford: Oxbow books.

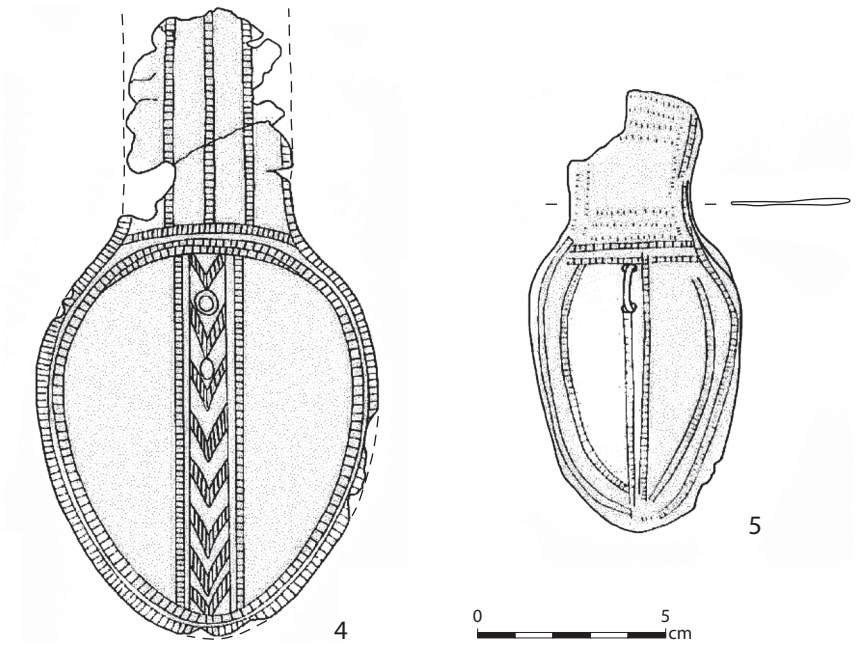
Zich, B., 1996. *Studien zur regionalen und chronologischen Gliederung der nordischen Aunjetitzer Kultur*, Vorgeschichtliche Forschungen 20. Berlin: de Gruyter.

TAFELN

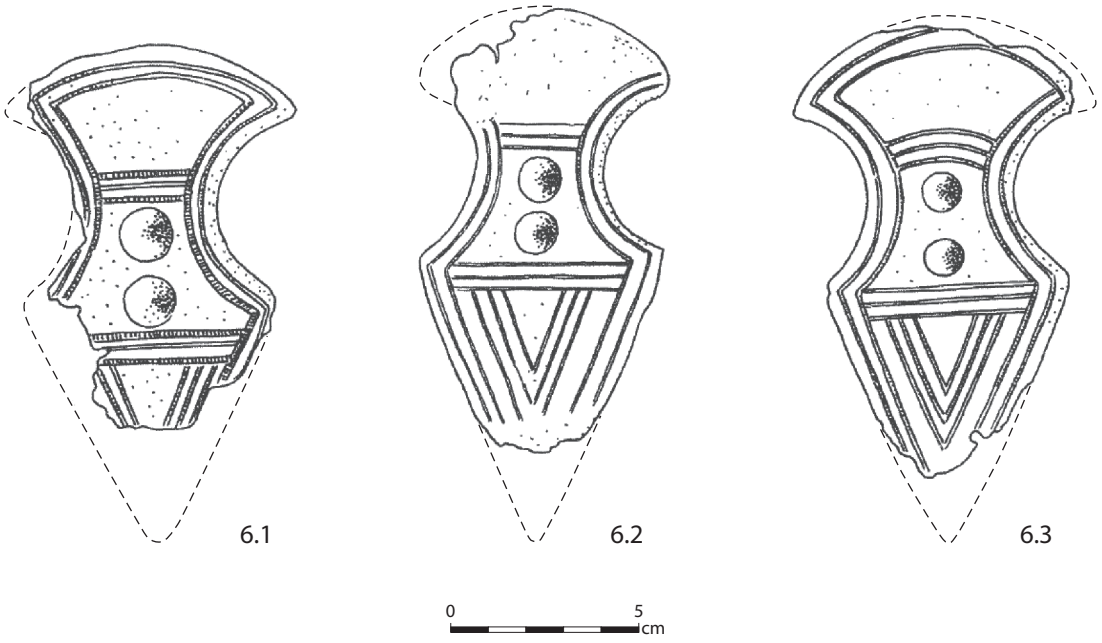


Tafel 1. Zusammenstellung der bisher bekannten Symboldolche. ***Typ 1*** *(Starý Bydzov).* ***1*** *Gajary, Okr. Malacky (Slowakei);* ***2*** *Starý Bydzov, Okr. Hradec Králové (Tschechien);* ***3*** *Opolany, Okr. Nymburk (Tschechien) (****1*** *Bartík und Zachar 2017, 65 Abb. 3;* ***2*** *Moucha 2005, Taf. 96.1;* ***3*** *Moucha 2005, Taf. 60.1–2).*

Typ 2

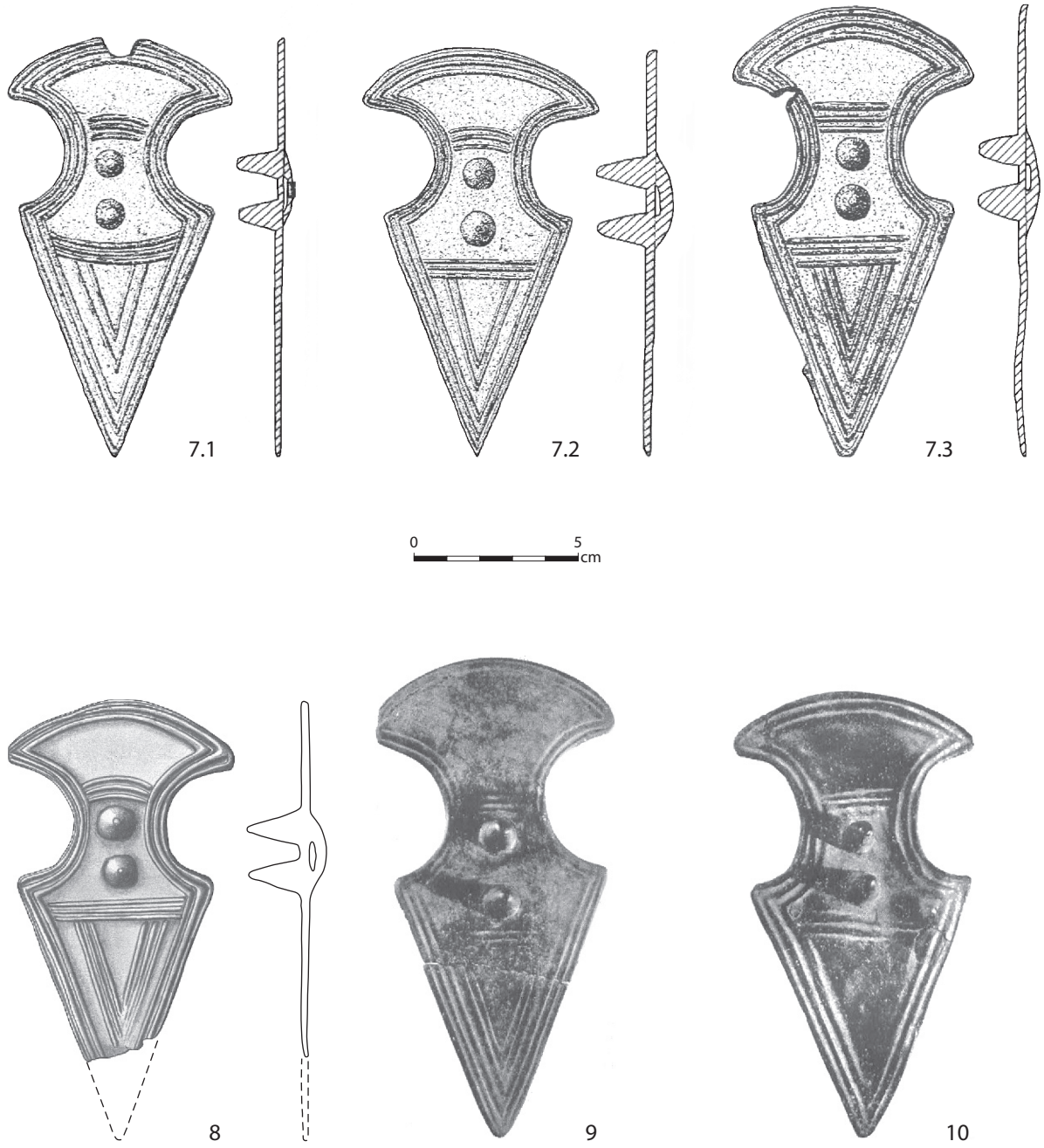


Typ 3 - *Variante 1*



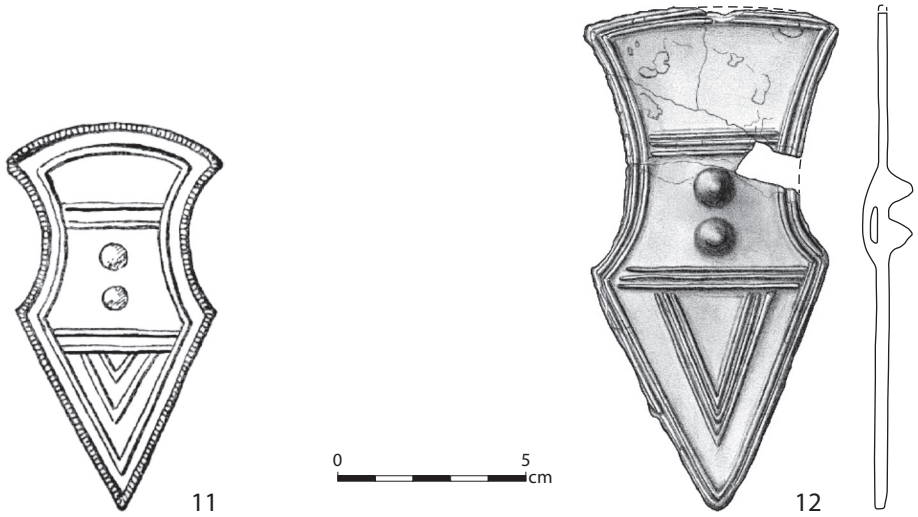
Tafel 2. Zusammenstellung der bisher bekannten Symboldolche. ***Typ 2*** *(Siedlce).* ***4*** *Siedlce, Woi. Masowien (Polen);* ***5*** *Żeńsko, Woi. Westpommern (Polen).* ***Typ 3*** *(Storkau),* ***Var. 1****.* ***6*** *Klein Wesenburg, Kr. Stormarn (****4*** *Szpunar 1987, Taf. 47 B10;* ***5*** *Szpunar 1987, Taf. 47 D1;* ***6.1*** *Hachmann 1957, Taf. 30.9;* ***6.2*** *Hachmann 1957, Taf. 30.10;* ***6.3*** *Hachmann 1957, Taf. 30.11).*

Typ 3 – Variante 1



Tafel 3. Zusammenstellung der bisher bekannten Symboldolche. ***Typ 3*** *(Storkau),* ***Var. 1****. 7 Marwedel, Lkr. Lüchow-Dannenberg;* ***8*** *Tucheim, Lkr. Jerichower Land;* ***9*** *Falkenwalde, Lkr. Uckermark;* ***10*** *Brandenburg-Plauerhof (****7.1*** *Laux 2005, 113 Abb. 5.8;* ***7.2*** *Laux 2005, 113 Abb. 5.9;* ***7.3*** *Laux 2005, 114 Abb. 6.1;* ***8*** *Mario Wiegmann;* ***9*** *Gandert 1938 Taf. 9a;* ***10*** *Gandert 1938 Taf. 9b).*

Typ 3 - *Variante 2*



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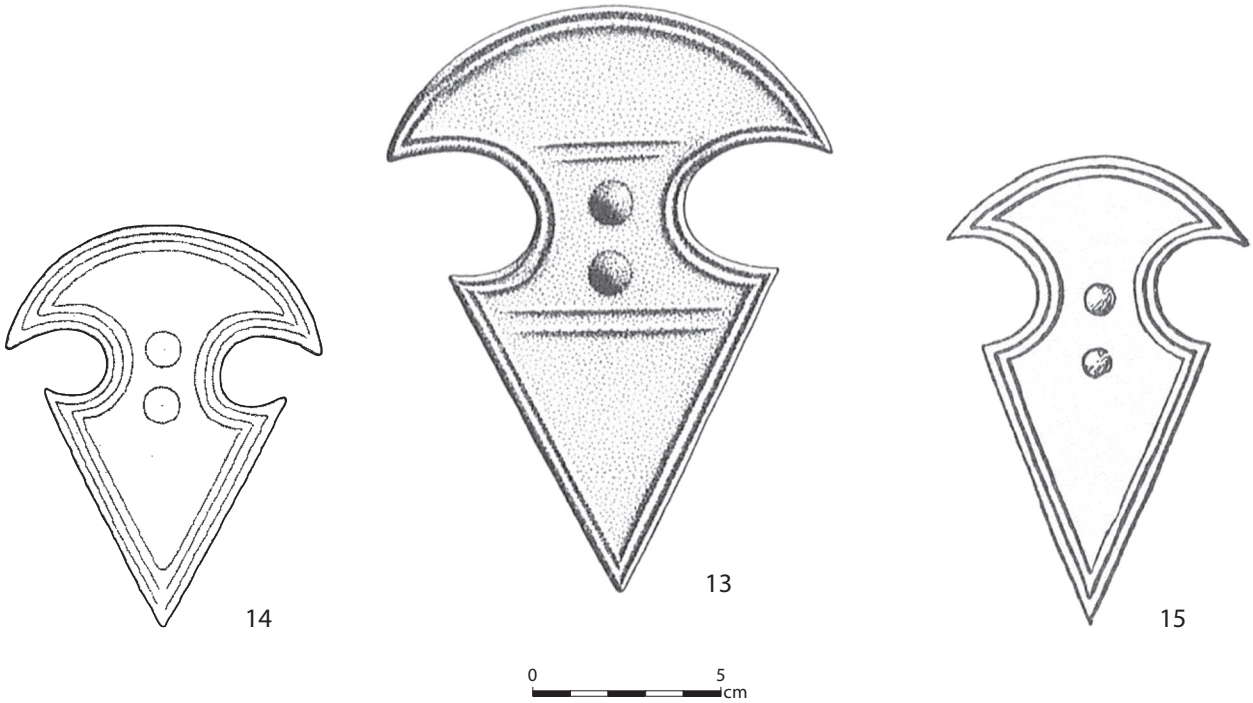

Tafel 4. Zusammenstellung der bisher bekannten Symboldolche. ***Typ 3*** *(Storkau),* ***Var. 2****.* ***11*** *Phöben, Lkr. Potsdam-Mittelmark;* ***12*** *Storkau, Lkr. Stendal.* ***Typ 4*** *(Poniec).* ***13*** *Poniec, Woi. Großpolen (Polen);* ***14*** *Kumiałtowice, Woi. Lebus (Polen);* ***15*** *Göda-Birkau, Lkr. Bautzen (****11*** *Gandert 1957, 37 Abb. 7.4;* ***12*** *Mario Wiegmann;* ***13*** *Gedl 1980, Taf. 27 D1;* ***14*** *Blajer 1990, 201 Tab. 49.1;* ***15*** *Gandert 1957, 37 Abb. 7.7).*

CHAPTER 5

The Social Significance of Burials

Figure chapter 5: Wangels, Ostholstein, Germany. Reconstructed view into the burial chamber of the megalithic tomb LA 69, c. 3400–1900 BCE (Drawing: Susanne Beyer; graphic: Petra Horstmann).

Oxhide-shaped Clay Find from the Lilla Åby Gallery Grave in Western Sweden

Malou Blank, Serena Sabatini

KEYWORDS: *copper oxhide ingot, metal trade, Nordic Late Neolithic, Nordic Early Bronze Age, pXRF analysis*

Abstract

In this paper, we discuss an oxhide-shaped find from the Lilla Åby gallery grave in the Swedish province of Västergötland. Gallery graves are abundant in Västergötland and, interestingly, many of these graves are considerably longer than similar graves in other regions of Scandinavia. The radiocarbon dates of the burials show that most of these graves were used during the Late Neolithic and throughout the Early Bronze Age. Jewellery and personal accessories recovered from these gallery graves suggest that the local communities had access to imported metals. As many other gallery graves, the Lilla Åby grave was already damaged at the time of its discovery and therefore only a part of it could be excavated. No metal objects were found, but a unique clay artefact was recovered, which resembles, in size and shape, miniature oxhide ingots from Southern Europe. Might this find be connected to long-distance metal trade?

Zusammenfassung

In diesem Beitrag wird ein Ochsenhaut-förmiger Fund aus dem Ganggrab Lilla Åby in der schwedischen Provinz Västergötland diskutiert. Galeriegräber sind in Västergötland weit verbreitet und viele dieser Gräber sind deutlich länger als ähnliche Grabformen in anderen Regionen Skandinaviens. Die Radiokarbondaten der Bestattungen zeigen, dass die meisten dieser Gräber während des Spätneolithikums und der frühen Bronzezeit genutzt wurden. Schmuck und persönliche Beigaben, die aus diesen Galeriegräbern geborgen wurden, deuten darauf hin, dass die lokalen Gemeinschaften Zugang zu importierten Metallen hatten. Wie viele andere Galeriegräber war auch das Grab von Lilla Åby zum Zeitpunkt seiner Entdeckung bereits beschädigt und konnte daher nur teilweise ausgegraben werden. Es wurden keine Metallgegenstände gefunden, aber ein einzigartiges Artefakt aus Ton, das in Größe und Form an die Miniaturbarren aus Ochsenhaut aus Südeuropa erinnert. Könnte dieser Fund mit dem Fernhandel mit Metallen in Verbindung stehen?

INTRODUCTION

The primary aim of this paper is to present a unique find recovered from the Lilla Åby gallery grave in the inland province of Västergötland (Fig. 1). The shape and the size of this clay object recalls unequivocally the miniature oxhide ingots from the southern part of the continent and the Mediterranean area. By drawing a connection between this object and the complex Mediterranean phenomenon and the overall Bronze Age metal trade, we forced ourselves out of our 'comfort zone'. Nevertheless, we believe it is important to present the find and to initiate a scientific debate about its meaning and function. We hope that Johannes will enjoy considering the piece and further discussing with us its possible significance for our understanding of Nordic Bronze Age societies.

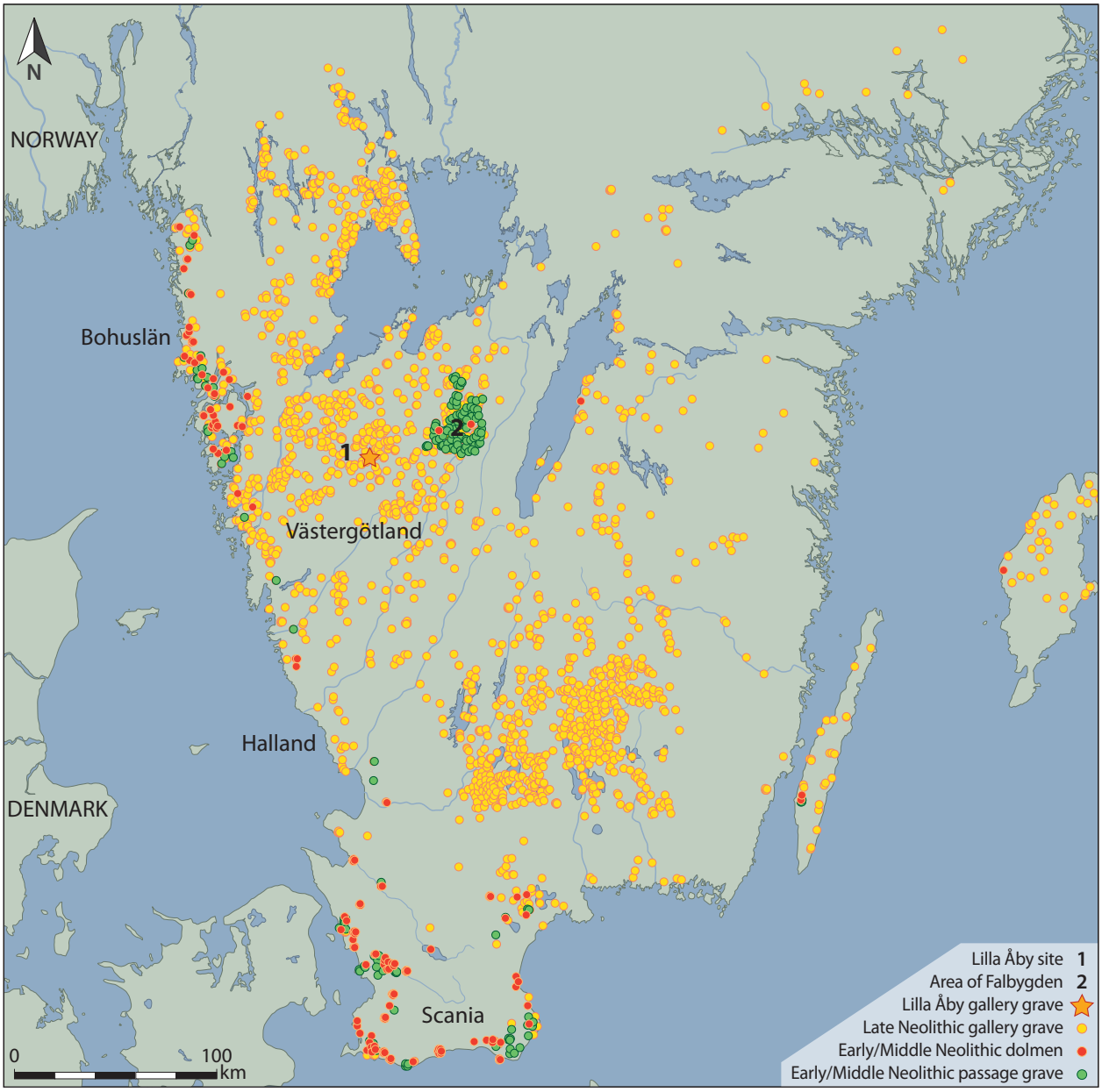

Fig. 1. Map of southern Sweden with the Lilla Åby site, the area of Falbygden, the distribution of Early/Middle Neolithic dolmens, Early/Middle Neolithic passage graves, and Late Neolithic gallery graves (Graphic: Malou Blank, map: Karin Winter).

METAL AND BRONZE AGE SOCIETIES

It is widely acknowledged that during the Bronze Age in general and, as for the scope of this paper, during the second half of the 2nd millennium BCE, the demand for copper and tin was very high throughout western Eurasia (*e.g.* Vandkilde 2016; Müller and Vandkilde 2020; Kristiansen 2022). The significant results of a decade of archaeometallurgical studies on Scandinavian Bronze Age metal items (Ling *et al.* 2014; Ling *et al.* 2019; Melheim *et al.* 2018; Radivojević *et al.* 2019; Nørgaard *et al.* 2021) have provided unexpected, and exceptional evidence for the variation in the channelling of metal supplies to the North of Europe. Thanks to these studies, it is evident that Mediterranean and continental societies were widely networking in order to facilitate and/or control this quest for metals (*e.g.* Rowland and Ling 2013; Earle *et al.* 2015; Kristiansen 2016; Ling *et al.* 2018; Sabatini and Lo Schiavo 2020; Sabatini and Kristiansen 2023). Understanding

the modes and characteristics in which these systems of metal exchange and trade operated at both the regional and interregional scales is an exciting challenge for many future studies on the topic.

This paper aims to contribute to our understanding of the Bronze Age world by drawing attention to a specific case study from Västergötland, Sweden, dated to the Nordic Early Bronze Age (ENBA).

EARLY NORDIC BRONZE AGE BURIALS AND SOCIETY IN VÄSTERGÖTLAND

Nordic Bronze Age societies are generally considered to have been hierarchically organised. Social structures were maintained and reproduced through a range of ritual practices, including elaborate and at times monumental graves, with the rest of the population being buried in simpler burials that are often difficult to find in the archaeological record (Harding 2000; Holst *et al.* 2001; Holst *et al.* 2013; Kristiansen 2012; Holst 2013; Skogstrand 2020). There is a vast literature on Bronze Age burials and the complex interplay of social, cultural, and economic factors manifesting in them. Johannes Müller and colleagues have interestingly suggested that the building of monumental mounds in the Early Nordic Bronze Age could be seen as a means for the rising elite to manifest power by reconnecting with ancient traditions still visible in the landscapes (such as for instance the Single Grave Culture typical burial mounds and the earlier megalithic graves) during times of social transformation (Czebreszuk *et al.* 2024; Müller 2002; Müller and Vandkilde 2020). The evidence from Sweden provides new insights for a broader understanding of local societies and suggests that ENBA (Early Nordic Bronze Age) elites might have adopted different strategies in the different regions. Although more studies are necessary, it seems that at least in the region of Västergötland (see Fig. 1) such a strategy included the re-use of earlier burial monuments and the continued use of the large Nordic Late Neolithic (LN) gallery graves typical of the region (see below).

A comprehensive study of radiocarbon-dated human remains from Scania in southern Sweden (Bergerbrant *et al.* 2017) revealed that many ENBA individuals were buried in flat graves and gallery graves. The authors concluded that these were the non-elite members of the local ENBA population, while the elite was buried in the monumental barrows and cairns. Social inequality between the individuals buried in the different grave types was also suggested by health assessments based on caries frequencies and the study of grave good assemblages (*e.g. ibid.*; Tornberg 2017). On the other hand, no significant difference in mobility patterns could be identified between the different social groups, based on the results of strontium isotope analyses (Bergerbrant *et al.* 2017).

In contrast to Scania, in Västergötland (see Fig. 1) ENBA burial architecture is dominated by small mounds/cairns (Sahlström 1932; Sahlström 1939; Weiler 1994; Blank 2017). At the same time, as in several parts of Southern Scandinavia, the LN gallery graves continued to be used and the Middle Neolithic (MN) megalithic graves were also reused (Sjögren 2003; Blank 2016; Blank *et al.* 2020a).

The burial landscape in ENBA Västergötland is far from being fully understood. The region has been the subject of limited investigations compared to, for example, Scania, which might explain some of the regional differences, such as the rare occurrence of flat graves, and settlements. Furthermore, local cairns and stone settings from the Bronze and Iron Age resemble closely in both shape and size, making it challenging to date any of these grave monuments when non-investigated. However, new knowledge has recently been added by the study of artefacts and radiocarbon-dated human remains from the gallery graves of inland Västergötland (Blank 2016; Blank *et al.* 2020a). Investigations have shown that these burial monuments were used continuously with successive inhumations throughout the entire LN and ENBA (*c.* 2200–1100 BCE). Our assumption is that gallery graves in Västergötland hold a special position for our understanding of ENBA societies.

Gallery graves are a significant expression of the LN period throughout southern Scandinavia and all the way up to the northern parts of Sweden (Montelius 1905; Ebbesen 2007; Østmo 2011; George 2017). No new gallery graves are built in the subsequent ENBA, although they continue to be in use (Blank *et al.* 2020a), possibly by different social groups in different regions (see below). Studies of the human remains buried in these monuments in Västergötland have revealed a distinct increase in mobility during the second part of the LN and the transition to the ENBA (Blank *et al.* 2021). What triggers such intensified mobility remain to be explained, but it is interesting to notice that it coincides with the growing occurrence of imported metal (bronze and gold) finds in Scandinavia (Vandkilde 2017; Blank 2021). One possible reason for this could therefore be the increased involvement of the local populations in long-distance exchange practices.

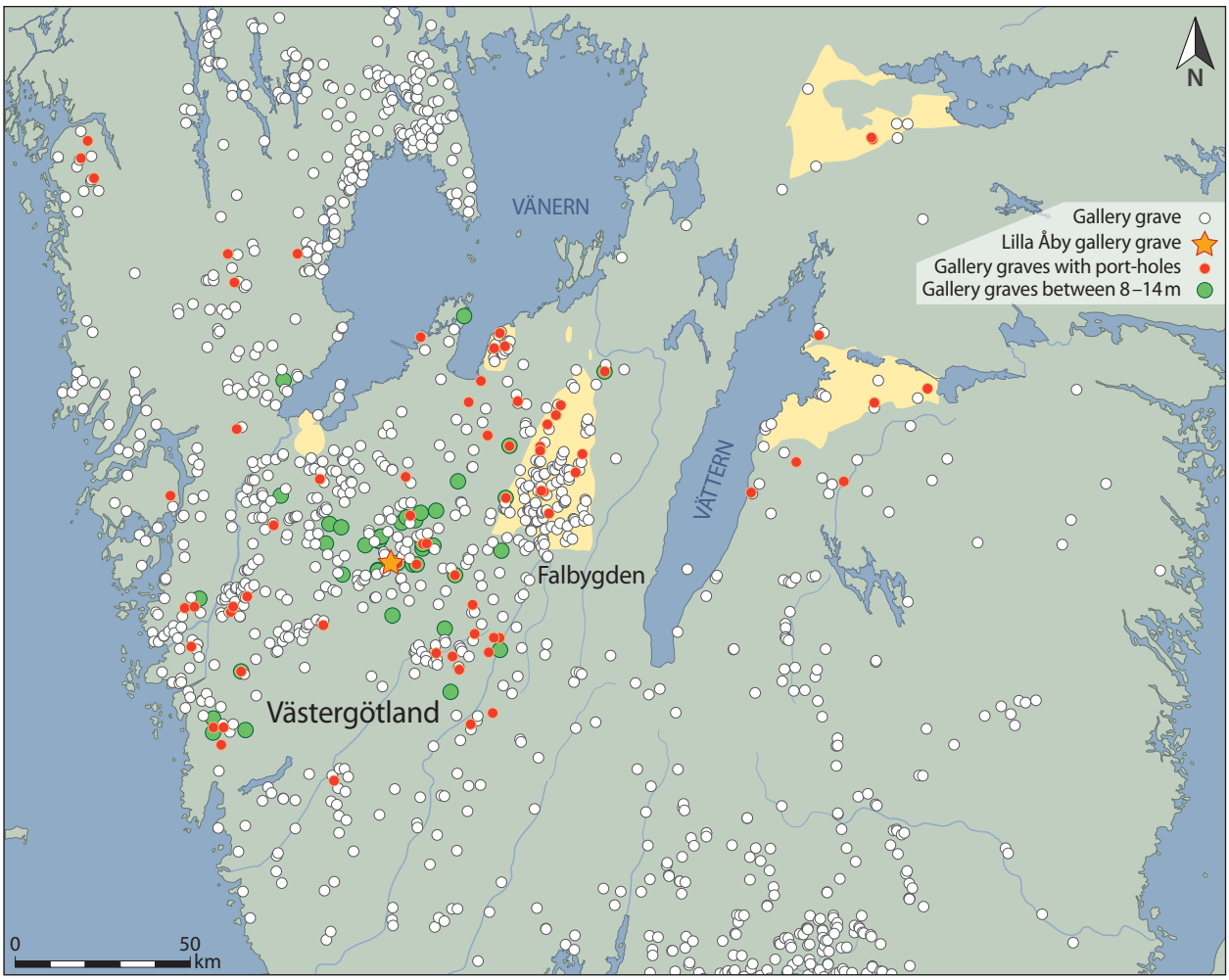

Fig. 2. Overview of southern Sweden with the distribution of gallery graves, gallery graves between 8–14 m, gallery graves with port-holes, and the Lilla Åby gallery grave (Graphic: Malou Blank, map: Karin Winter).

The gallery graves from Västergötland differ from those in other regions in terms of length, size, construction details and, in some cases, the characteristics of the grave goods. Scanian, eastern Swedish and Danish gallery graves are generally two to three meters long (Ebbesen 2007), while most of these graves in Västergötland are between five and seven meters long (Weiler 1994, 56), although a range of different shapes and sizes exist (Blank 2021, 27). Very long gallery graves measuring between eight and 14 meters are restricted to Västergötland with significant concentrations in the central part of the province (Fig. 2). Many of these graves are also multi-chambered with port-holes in the chamber walls, a construction detail which only can be found in a belt from western into the eastern parts of Sweden (Fig. 2).

Common ENBA grave goods in such graves are gold and bronze clothing accessories and jewellery, while bronze tools and weapons, which are found in large numbers as single depositions in the surrounding landscape (Weiler 1994; Blank 2017), are generally absent from the graves. Other imported items recovered from the gallery graves are flint daggers and a few (of the later types) can be dated to the ENBA (Apel 2001; Blank 2022). Even though the quality of the available documentation is not uniform or complete, the ENBA depositions in these large gallery graves show an acquaintance with long-distance exchange networks (Blank 2021; Blank and Bergerbrant in prep.). The recurrence of bronze and gold artefacts also indicates that -differently from what has been proposed for Scania (Bergerbrant *et al.* 2017)- highly ranked members of the Västergötland ENBA communities could have been buried in these monuments.

LILLA ÅBY GALLERY GRAVE

The Lilla Åby gallery graves is located in the Landa parish in Västergötland (Fig. 1–2). The Landa parish was probably relatively densely inhabited during the Bronze Age; different types of graves have been documented, including small cairns with pottery vessels and cremated bones, and at least five large gallery graves which most probably were used into the ENBA.

Fig. 3. The oxhide-shaped clay find from the Lilla Åby gallery grave (Photo: Malou Blank).

Interestingly, two particularly long gallery graves, the Landa Mader and the Landa Storgård (eight and eleven meters, respectively), come from the parish and are situated less than one kilometre from the Lilla Åby grave. They both consisted of several chambers, had port-holes (Arne 1925) and represent typical burial constructions from Västergötland, often linked to long-distance exchanges, as they generally contained imported metal grave goods. At the time of its discovery, the grave had been considerably damaged. It was found in a low profiled cairn and consisted of five remaining slabs. According to the landowner, the grave had been dug by farmers around 1850, when most of the stone slabs were removed (Benjaminsson 1922). Frithiof Benjaminsson excavated part of the grave, an area of about 2.0 x 1.5 m between the remaining slabs, in 1922. The exact shape and the construction details of the grave are unknown, but the grave was estimated to a size of 6.6 x 1.5 m, oriented NE to SW (Alin 1924), which is a common orientation for the Västergötland gallery graves (Weiler 1994). Frithiof Benjaminsson (1922) reported finds of ceramic sherds, flint pieces, a clay object, and a pottery vessel at the bottom at the eastern wall slab. The artefacts[1] from the grave are stored in the depository of National Historical Museums in Stockholm (inv. no. SHM 17575) and have been re-examined in 2018. The slightly protruding base of the pottery vessel, the late dagger type (Lomborg 1973) as well as the slate pendant indicate a use between the LNII and the ENBA (Anderbjörk 1932; Stilborg 2002, 78; Blank 2022). Among the artefacts from the grave is an unidentified clay object (no. 9), approximately 3 x 4.5 cm in size, and *c.* 1 cm thick, with the outline of a miniature oxhide ingot (Fig. 3).

THE CLAY OXHIDE-SHAPED OBJECT FROM LILLA ÅBY

The oxhide-shaped object from Lilla Åby, is to our knowledge a *unicum*. No similar objects have been reported so far from other parts of Scandinavia, continental Europe or the Mediterranean.[2] It is a small find of unbaked clay with a clear oxhide-like outline (Fig. 3). The size of the find matches that of some of the miniature oxhide ingots found in other European regions, but all other known miniature oxhide ingots are metal artefacts (*e.g.* Giumlia Mair *et al.* 2011; Sabatini 2016a; 2016b; Sabatini in press).

1 The finds from the graves are: two flint scrapers (no. 1, 11), a flint dagger (Lomborg type VA), flint flakes (one with retouch), a slate pendant (Y-drilled) and pottery sherds. Most of the pottery sherds were undecorated, relatively thick walled with quartz and granite temper (no. 5–7, 13). Three decorated (stamp, line, plastic) sherds (no. 4) were also recovered and a straight walled pottery vessel with a slightly protruding base.

2 Indeed, a second exception should be mentioned; an oxhide-shaped bone bead, *c.* 20 mm long, was recovered in an inhumation grave next to a barrow in Funen, Denmark. The burial was radiocarbon dated to 1660–1499 cal BC (Beck 2022). To understand whether the shape of the bone bead responds to esthetic norms or is meant to represent an oxhide ingot is a challenging task. Further studies will hopefully shed new light on this intriguing object.

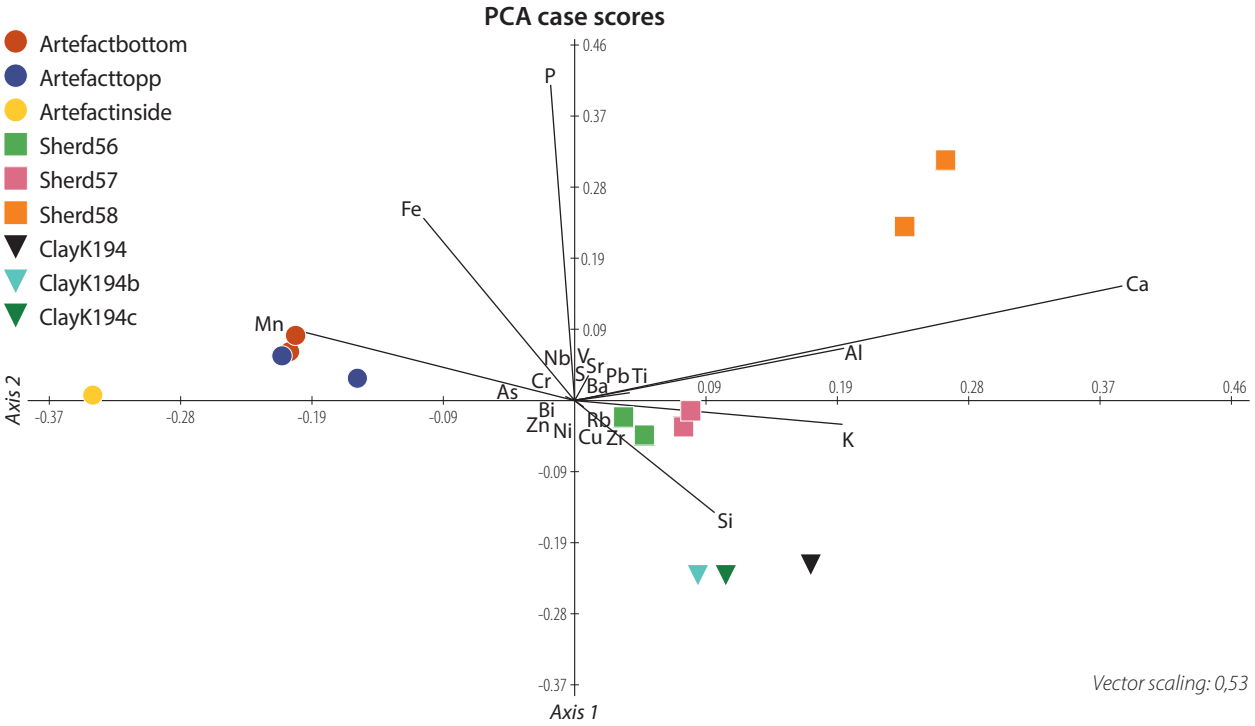

Fig. 4. PCA plot (MVSP 3.22) of elemental composition from the Lilla Åby clay artefact (circles), pottery (squares) and Falbygden clay (triangles). All percentage values were logarithmised prior to the application of PCA analysis to reduce the effects of relative scaling. The clay artefact contained detectable arsenic values, lower calcium, and higher iron and manganese levels compared to the other items (Graphic: Malou Blank).

The Lilla Åby find, despite its unmistakable outline, has a considerable oval recess on one side and is thus largely empty on the inside. It is a light, portable object that shows no signs of having been burned or of having been in close contact with metal. To the naked eye, there are no traces of any kind of residue are visible on the object or inside the recess, if it ever was meant to contain anything. Being unbaked, it is supposedly a rather fragile item, but it is remarkably well-preserved. Its good state of preservation suggests that it was handled with great care.

In order to get some further clues as to the function and origin of this object, we analysed its elemental composition using a non-destructive method. A portable Niton XRF -XL3t goldd+ was used with a beam size of 8 mm, penetrating the material *c.* 5 mm.[3] The purpose was to identify possible traces of remains not visible to the eye and to determine the chemical composition of the clay.

The pXRF analyses detected relatively typical clay components and no other substances. There is no available reference material of local clay from the Landa parish and therefore the results of the pXRF analyses presented here are of limited value. Instead, we compared the results from the clay find with pXRF measurements carried out on three of the many pottery sherds from the Lilla Åby grave.

At the time of this writing, we cannot say whether the pottery sherds are locally made, although this would seem a typical trend in Neolithic and Bronze Age southern Scandinavia (*e.g.* Brorsson and Hulthén 2007; Sabatini *et al.* 2020; Blank *et al.* 2020b). Our analyses revealed that the elemental composition of the oxhide-like artefact deviates clearly from that of the pottery sherds from the same grave and was likely produced with raw materials from a different source or region. Reference clay samples from West-Sweden are limited, but we were able to include three analyses on clay from the neighbouring area of Falbygden in our dataset (cf. Fig. 1). The comparison shows that the clay of the oxhide-like find from Lilla Åby clearly differs also from the clay from Falbygden (Fig. 4). Although not conclusive, the pXRF analysis suggests that the object may have been imported.

3 The machine was set on "soils and minerals" and "mining Cu/Zn. The four filters were set on 60 seconds each, which results in a total measurement time of 240 seconds. System checks were performed before the analyses, and a reference sample was measured regularly as a precaution.

Fig. 5. Distribution map of the oxhide ingots (Graphic: Malou Blank, map: Karin Winter).

CONCLUDING REFLECTIONS: THE OXHIDE INGOT PHENOMENON, AND THE LILLA ÅBY CLAY FIND

This is not the place to comprehensively discuss the oxhide ingot phenomenon; oxhide ingots are an impressive category of Bronze Age artefact, whose shape and size are particularly suitable for the maritime transportation of large quantities of raw metal (*e.g.* Bass 1967; Pulak 1998; Pulak 2008; Öniz 2025; Kassianidou 2021). They have been in use during the Mediterranean Late Bronze Age (*c.* 1600–1100 BC), roughly contemporary to the ENBA, and show an impressive distribution pattern stretching from the eastern and central Mediterranean to continental Europe and Scandinavia (*e.g.* Primas and Pernicka 1998; Gale 2006; Jones 2007;

Lo Schiavo *et al.* 2009; Gale and Stos-Gale 2012; Kassianidou 2012; Kassianidou 2021; Sabatini 2016a; 2016b; Sabatini and Lo Schiavo 2020; Sabatini in press). Most of the known ingots come from southern Europe and the eastern Mediterranean (Fig. 5) and there is no doubt that they are one of the most prominent expressions of the Late Bronze Age metal trade in the region.

Despite different copper ores have been used to produce those ingots, from *c.* 1500/1450 BCE and onwards, most of them are manufactured with Cypriot copper (Gale 2006; Gale 2011; Gale and Stos-Gale 2012). Multifaceted archaeological evidence from the island (*e.g.* Papasavvas 2009; Kassianidou 2012; Lo Schiavo 2018) corroborates the hypothesis that, from that time onwards, oxhide ingots became a sort of branded product from Cyprus (Bevan 2010; Sabatini 2016b).

There is no evidence for metal oxhide ingots in Northern Europe, but rock carvings likely representing oxhide ingots have been discovered in both western and eastern Sweden, suggesting that these items were known in this part of the continent (cf. Ling and Stos-Gale 2015; see also Sabatini 2016b).

In addition to full-size oxhide ingots, miniature metal oxhide ingots are also known (*e.g.* Giumlia Mair *et al.* 2011; Sabatini 2016a; 2016b; Atanassov *et al.* 2020; Sabatini in press). They are to a certain extent a distinct phenomenon, mostly dated to 1300–1100 BCE (*ibid.*) and broadly distributed in south-eastern Europe and Cyprus (Fig. 5). Most of the known miniature oxhide ingots from continental Europe come from contexts strongly associated with metallurgy or some kind of metallurgical activity (Sabatini 2016b; Sabatini in press). Different theories have been put forward to explain their significance (*e.g.* Pare 1999; Giumlia Mayr *et al.* 2011; Ferrara and Bell 2016; Sabatini 2016b; Sabatini in press). Among others, it has been proposed to consider them as part of a strategy to revive the oxhide ingot phenomenon, in a time of economic and political transformation all over the Mediterranean after 1300 BCE (Sabatini in press.).

Can the clay object from the Lilla Åby gallery grave in inland Västergötland contribute to a better understanding of the whole phenomenon? It is obviously not a metal ingot, but it could serve as a symbolic representation of it. Additionally, it is possible to imagine that its recess (see Fig. 3) was used to allocate an item or simply a thumb, enabling to press the opposite flat face into a soft support. In other words, one possible function for this find could be that of a stamp. Indeed, if the item were pressed into a relatively soft matter such as for instance clay, wax, or sand, it would leave a clear oxhide-shaped impression.

Differently from the full-size oxhide ingots, which were likely cast in open moulds, as the characteristic surface of one of their faces strongly suggests, miniature ingots seem to have been generally produced in closed moulds (see *e.g.* Giumlia-Mair *et al.* 2011; Atanassov *et al.* 2020). Was the find from Lilla Åby manufactured to represent a miniature oxhide ingot? Or could we imagine that it was manufactured with the aim to prepare clay moulds for miniature oxhide ingots? Of course, other interpretations are possible, but the idea is attractive, and the significant link of the regional gallery graves with long-distance exchange and the increased flow of metal imports to Scandinavia makes the hypothesis, in our view, intriguing.

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REFERENCES

Alin, J., 1924. *Hällkista vid Landa Storegården, Landa socken, Samuel Johanssons ägor*. Landa parish, VG (Dnr: 1903/24), ATA, Stockholm (unpublished/archive).

Anderbjörk, J.E., 1932. Västergötlands megalitgravar. *Västergötlands Fornminnesförenings Tidskrift* 4(5–6), 5–38.

Apel, J., 2001. *Daggers, knowledge & power*. PhD thesis. Uppsala: Uppsala University.

Arne, F.J., 1925. *Rapport om undersökning och restaurering av fornlämningar i Landa socken, VG*. Landa parish, VG (Dnr: 2776/25), ATA, Stockholm (unpublished/archive).

Athanassov, B., Chernakov, D., Dimitrov, K., Krauss, R., Popov, H., Schwab, R., Slachev, V. and Pernicka, E., 2020. A New Look at the Late Bronze Age Oxhide Ingots from the Eastern Balkans. *In*: J. Maran, R. Băjenaru, S.-C. Ailincăi, A.-D. Popescu and S. Hansen, eds. *Objects, Ideas and Travelers. Contacts between the Balkans, the Aegean and Western Anatolia during the Bronze and Early Iron Age*. Volume to the memory of Alexandru Vulpe. Bonn: Habelt, 299–356.

Austvoll, K.I., Hem Eriksen, M., Ditlef Fredriksen, P., Melheim, L., Prøsch-Danielsen, L. and Skogstrand, L., eds., 2020. Contrasts of the Nordic Bronze Age. Essays in Honour of Christopher Prescott, *The archaeology of Northern Europe* 1. Turnhout: Brepols.

Bass, G.F., 1967. Cape Gelidonya: A Bronze Age Shipwreck, *Transactions of the American Philosophical Society* 57(8), 1–177.

Beck, M.R., 2022. Old traditions meeting new ideas. *In*: *Tornberg et al. 2022*, 141–158.

Benjaminsson, F., 1922. *Stenåldersgravar i Landa socken, Älvsborgslän*. Landa parish, VG (Dnr: 1315/1924), ATA, Stockholm (unpublished/archive).

Bergerbrant, S., Kristiansen, K., Allentoft, M.E., Frei, K.M., Rice, T.D., Sjögren, K.-G. and Tornberg, A., 2017. *New perspectives on the Bronze Age. Proceedings of the 13th Nordic Bronze Age Symposium 9th–13th June in Gothenburg*. Oxford: Archaeopress.

Bergerbrant, S., Kristiansen, K., Allentoft, M.E., Frei, K.M., Rice, T.D., Sjögren, K.-G. and Tornberg, A., 2017. Identifying commoners in the Early Bronze Age. Burials outside barrows. *In: Bergerbrant and Wessman 2017*, 37–64.

Betancourt, P.P. and Ferrence, S.C., eds., 2011. *Metallurgy: Understanding How, Learning Why. Studies in Honour of James D. Muhly*. Philadelphia, PE: INSTAP Academic Press.

Bevan, A., 2010. Making and Marking Relationships: Bronze Age Branding and Mediterranean Commodities. *In*: A. Bevan and D. Wengrow, eds. *Cultures of Commodity Branding*. Walnut Creek, CA: Left Coast Press, 35–85.

Blank, M., 2016. Prehistoric Activities in Megalithic Graves in Falbygden, Sweden. *Lund Archaeological Review* 21 (2015), 49–70.

Blank, M., 2017. Bronze Age burials in megalithic graves in Falbygden. *In: Bergerbrant/Wessman 2017*, 19–36.

Blank, M., 2021. *Mobility, Subsistence and Mortuary practices. An interdisciplinary study of Neolithic and Early Bronze Age megalithic populations of southwestern Sweden*. Gothenburg: University of Gothenburg, GOTARC Series B 78.

Blank, M., 2022. Flint daggers and related artefacts in megalithic tombs of south-western Sweden. *In*: *Tornberg et al. 2022*, 73–98.

Blank, M. and Bergerbrant, S., in preparation. *Skogsbo gallery grave revisited – A study of Late Neolithic and Early Bronze Age networks in the inland of southwestern Sweden*.

Blank, M., Sjögren, K.-G. and Storå, J., 2020a. Old bones or early graves? Megalithic burial sequences in southern Sweden based on ^{14}C datings. *Archaeological and Anthropological Sciences* 12(89), 1–33. https://doi.org/10.1007/s12520-020-01039-9

Blank, M., Brorsson, T. and Bakunic Fridén, I., 2020b. Provenancing Neolithic pottery. An investigation of the elemental composition of Pitted Ware and Funnel Beaker pottery from Djursland and adjacent regions. *In*: L. Klassen, ed. *The Pitted Ware Culture on Djursland: Supra-regional significance and contacts in the Middle Neolithic of southern Scandinavia*, East Jutland Museum Publications 5. Århus: Århus University Press, 385–407.

Blank, M., Sjögren, K.-G., Knipper, C., Frei, K.M., Malmström, H., Fraser, M., Svensson, E., Günther, T., Yngve, H., Jakobsson M., Götherström, A. and Storå, J., 2021. Mobility patterns in inland southwestern Sweden during the Neolithic and Early Bronze Age. *Archaeological and Anthropological Sciences* 13(64), 1–32.

Brorsson, T. and Hulthén, B., 2007. Leran och elden. En studie av keramiken från Vætland. *In*: M. Artursson, ed. *Vägar till Vætland. En bronsåldersbygd i nordöstra Skåne 2300–500*. Stockholm: Riksantikvarieämbetet, 265–293.

Czebreszuk, J., Müller, J., Szmyt, M., Goslar, T., Jaeger, M., Hildebrandt-Radke, I., Niebieszczański, J., Gmińska-Nowak, B., Ważny, T., Kneisel, J., Krause-Kyora, B., Makowiecki, D., Rewekant, A., Kotova, N., Rennwanz, J. and Raese, H., 2024. Chronology and social significance of the "princely" barrow cemetery in Łęki Małe and the Central European Early Bronze Age. *PLoS ONE* 19(5), e0300591. https://doi.org/10.1371/journal.pone.0300591

Ebbesen, K., 2007. Danske hellekister fra stenalderen. *Aarbøger for nordisk Oldkyndighed og Historie* 2004, 7–62.

Earle, T., Ling, J., Uhnér, C., Stos-Gale, Z. and Melheim, L., 2015. The Political Economy and Metal Trade in Bronze Age Europe: Understanding Regional Variability in Terms of Comparative Advantage and Articulations. *European Journal of Archaeology* 18, 633–657. https://doi.org/10.1179/1461957115Y.0000000008

Ferrara, S. and Bell, C., 2016. Tracing Copper in the Cypro-Minoan Script. *Antiquity* 90(352), 1009–1021. https://doi.org/10.15184/aqy.2016.66

Gale, N.H., 2006. Lead Isotope Studies – Sardinia and the Mediterranean: Provenance Studies of Artefacts Found in Sardinia. *Instrumentum* 23, 29–34.

Gale, N.H., 2011. Copper Oxhide Ingots and Lead Isotope Provenancing. *In: Betancourt and Ferrence 2011*, 213–220.

Gale, N.H. and Stos-Gale, Z.A., 2012. The Role of the Apliki Mine Region in the Post C. 1400 BC Copper Production and Trade Networks in Cyprus and in the Wider Mediterranean. *In*: V. Kassianidou and G. Papasavvas, eds. *Eastern Mediterranean Metallurgy and Metalwork in the Second Millennium BC*. Oxford: Oxbow Books, 70–82.

George, O., 2017. *Arkeologisk undersökning I anslutning till stenkammargraven Raä 1 i Indal socken, Sundsvalls kommun*. Härnösand: Murberget Länsmuseet Västernorrland rapportnr. 2017:10 (archaeological report).

Giumlia-Mair, A., Kassianidou, V. and Papasavvas, G., 2011. Miniature ingots from Cyprus. *In: Betancourt and Ferrence 2011*, 11–20.

Harding, A., 2000. *European Societies in the Bronze Age*. Cambridge: Cambridge University Press.

Holst, M.K., 2013. Burials. *In*: H. Fokkens and A. Harding, eds. *The Oxford Handbook of the European Bronze Age*. Oxford: Oxford University Press, 102–120.

Holst, M.K., Breuning-Madsen, H. and Rasmussen, M., 2001. The south Scandinavian barrows with well-preserved oaklog coffins. *Antiquity* 75(287), 126–136.

Holst, M.K., Rasmussen, M., Kristiansen, K. and Bech, J.-H., 2013. Bronze Age "Herostrats": Ritual, political, and domestic economies in Early Bronze Age Denmark. *Proceedings of the Prehistoric Society* 79, 265–96.

Jones, M.R., 2007. *Oxhide Ingots, Copper Production, and the Mediterranean Trade in Copper and Other Metals in the Bronze Age*. PhD thesis. Texas: Texas A & M University.

Kassianidou, V., 2012. Copper Oxhide Ingots and Cyprus – The Story so Far. *Numismatic Report*, XXXIL–XLIII, 9–54.

Kassianidou, V., 2021. Oxhide ingots 2020. New Research. *In: Perra and Lo Schiavo 2023*, 109–125.

Kristiansen, K., 2012. Bronze Age Dialectic: Ritual Economies and the Consolidation of Social Division'. *In*: T.L. Kienlin and A. Zimmermann, eds. *Beyond Elites. Alternatives to Hierarchical Systems in Modelling Social Formations. International Conference at the Ruhr-Universität Bochum, Germany, Oct. 22–24, 2009*, Universitätsforschungen zur prähistorischen Archäologie 215. Bonn: Habelt, 381–392.

Kristiansen, K., 2016. Interpreting Bronze Age Trade and Migration. *In*: E. Kiriatzi and C. Knappett, eds. *Human Mobility and Technological Transfer in the Prehistoric Mediterranean*. Cambridge: Cambridge University Press, 154–181.

Kristiansen, K., 2022. Bronze Age globalization in numbers Volumes of trade and its organization. *In*: D. Hofman, F. Nikulka and R. Schumann, eds. *The Baltic in the Bronze Age. Regional patterns, interactions and boundaries*. Leiden: Sidestone Press, 1–20.

Ling, J. and Stos-Gale, Z., 2015. Representations of Oxhide Ingots in Scandinavian Rock Art: The Sketchbook of a Bronze Age Traveller? *Antiquity* 89, 191–209. https://doi.org/10.15184/aqy.2014.1

Ling, J., Stos-Gale, Z., Grandin, L., Billström, K., Hjärthner-Holdar, E. and Persson, P.-O., 2014. Moving Metals II: Provenancing Scandinavian Bronze Age Artefacts by Lead Isotope and Elemental Analyses. *Journal of Archaeological Science* 41, 106–132. https://doi.org10.1016/j.jas.2013.07.018

Ling, J., Earle, T. and Kristiansen, K., 2018. Maritime Mode of Production: Raiding and Trading in Seafaring Chiefdoms. *Current Anthropology* 59, 488–524.

Ling, J., Hjärthner-Holdar, E., Grandin, L., Stos-Gale, Z., Kristiansen, K., Melheim, A.L., Artioli, G., Angelini, I., Krause, R. and Canovaro, C., 2019. Moving Metals IV: Swords, Metal Sources and Trade Networks in Bronze Age Europe. *Journal of Archaeological Science: Reports* 26, 101837. https://doi.org/10.1016/j.jasrep.2019.05.002

Lo Schiavo, F., 2018. Lingotti Oxhide e oltre. Sintesi ed aggiornamenti nel Mediterraneo e in Sardegna (Oxhide Ingots and Beyond. Synthesis and Updating in the Mediterranean and in Sardinia). *In*: A. Giumlia-Mair and F. Lo Schiavo, eds. *Bronze Age Metallurgy in the Mediterranean Islands, in Honour of Robert Maddin and Vassos Karageorghis*. Drémil-Lafage: Éditions Mergoil, 13–55.

Lo Schiavo, F., Muhly, J., Maddin, R. and Giumlia-Mair, A., 2009. *The Oxhide Ingots in the Central Mediterranean*. Rome: ICEVO-CNR.

Lomborg, E., 1973. *Die Flintdolche Dänemarks. Studien über Chronologie und Kulturbeziehungen des südskandinavischen Spätneolithikums*, Nordiske Fortidsminder Serie B 1.

Melheim, L., Grandin, L., Persson, P.-O., Billström, K., Stos-Gale, Z., Ling, J., Williams, A., Angelini, I., Canovaro, C., Hjärthner-Holdar, E. and Kristansen, K., 2018. Moving Metals III: Possible Origins for Copper in Bronze Age Denmark Based on Lead Isotopes and Geochemistry. *Journal of Archaeological Science* 96, 85–105. https://doi.org10.1016/j.jas.2018.04.003

Montelius, O., 1905. Orienten och Europa. *Antiqvarisk Tidskrift för Sverige* XIII, 1–252.

Müller, J., 2002. 'Modelle zur Einführung der Zinnbronzetechnologie und zur Sozialen Differenzierung der Mitteleuropäischen Frühbronzezeit'. *In*: J. Müller, ed. *Vom Endneolithikum zur Frühbronzezeit: Muster Sozialen Wandels?* Tagung Bamberg 14.–16. Juni 2001, Universitätsforschungen zur prähistorischen Archäologie 90. Bonn: Habelt, 267–89.

Müller, J. and Vandkilde, H., 2020. The Nordic Bronze Age Rose from Copper Age Diversity Contrasts in the Cimbrian Peninsula. *In*: *Austvoll et al. 2020*, 29–48.

Nørgaard, W.H., Pernicka, E. and Vandkilde, H., 2021. Shifting networks and mixing metals: Changing metal trade routes to Scandinavia correlate with Neolithic and Bronze Age transformations. *PLoS ONE* 16(6), e0252376. https://doi.org/10.1371/journal.pone.0252376

Öniz, H., 2025. Traces of Mynos in Kumluca Bronze Age Shipwreck: 2022, 2023, 2024 Excavation Seasons. *Journal of Maritime Archaeology* 20, 455–472. https://doi.org/10.1007/s11457-025-09453-7

Østmo, E., 2011. *Krigergraver. En dokumentarisk studie av hellekister i Norge*. Oslo: Kulturhistorisk museum/Oslo University.

Papasavvas, G., 2009. The Iconography of the Oxhide Ingots. *In*: F. Lo Schiavo, J.D. Muhly, R. Maddin and A. Giumlia-Mair, eds. *The Oxhide Ingots in the Central Mediterranean*. Rome: ICEVO-CNR, 83–117.

Pare, C.F.E., 1999. Weights and weighting in Bronze Age central Europe. *In*: I. Kilian-Dirlmeier and M. Egg, eds. *Eliten in der Bronzezeit*, Monographien 1. Mainz: Verlag des Römisch-Germanischen Zentralmuseums, 421–514.

Perra, M. and Lo Schiavo, F., eds., 2023. *Contacts and exchanges between Sardinia, continental Italy and the north-western Europe in the bronze age (18th–11th cal BC): the "Copper route", the "Amber route", the "Tin route"*. Cagliari: Arkadia.

Primas, M. and Pernicka, E., 1998. Der Depotfund von Oberwilflingen. *Germania* 76, 25–65.

Pulak, C., 1998. The Uluburun Shipwreck: An Overview. *International Journal of Nautical Archaeology* 27(3), 188–224. https://doi.org/10.1111/j.1095-9270.1998.tb00803.x

Pulak, C., 2008. The Uluburun Shipwreck and Late Bronze Age Trade. *In*: J. Aruz, K. Benzel and J.M. Evans, eds. *Beyond Babylon: Art, Trade, and Diplomacy in the Second Millennium B.C.* New York: MetPublications, 289–385.

Radivojević, M., Roberts, B.W., Pernicka, E., Stos-Gale, Z., Martinón-Torres, M., Rehren, T., Bray, P., Brandherm, D., Ling, J., Mei, J., Vandkilde, H., Kristiansen, K., Shennan, S. and Broodbank, C., 2019. The Provenance, Use, and Circulation of Metals in the European Bronze Age: The State of Debate. *Journal of Archaeological Research* 27, 131–185. https://doi.org/10.1007/s10814-018-9123-9

Rowlands, M. and Ling, J., 2013. Boundaries, Flows and Connectivities: Mobility and Stasis in the Bronze Age. *In*: S. Bergerbrant and S. Sabatini, eds. *Counterpoint: Essays in Archaeology and Heritage Studies in Honour of Professor Kristian Kristiansen*, British Archaeological Report International Series 2508. Oxford: Archaeopress, 517–529.

Sabatini, S., 2016a. Late Bronze Age Oxhide and Oxhide-like Ingots from Areas Other than the Mediterranean: Problems and Challenges. *Oxford Journal of Archaeology* 35, 29–45. https://doi.org/10.1111/ojoa.12077

Sabatini, S., 2016b. Revisiting Late Bronze Age Copper Oxhide Ingots: Meanings, Questions and Perspectives. *In*: O.C. Aslaksen, ed. *Local and Global Perspectives on Mobility in the Eastern Mediterranean*. Athens: Norwegian Institute in Athens, 15–62.

Sabatini, S., in press. Full-size and miniature oxhide ingots: Reflections on the Late Bronze Age metal trade in the Mediterranean and beyond. *In*: T. Kerig and J. Hilpert, eds. *Inqualities in Supra-regional Eurasian Exchange Networks*, ROOTS Cluster of Excellence Series. Kiel: Sidestone Press.

Sabatini, S. and Lo Schiavo, F., 2020. Late Bronze Age Metal Exploitation and Trade. *Sardinia and Cyprus, Material and Manufacturing Processes* 35(13), 1501–1518. https://doi.org/10.1080/10426914.2020.1758329

Sabatini, S. and Kristiansen, K., 2023. The missing link: Re-theorising the role of Sardinia in a global political economy between the Mediterranean and Atlantic Europe. *In: Perra and Lo Schiavo 2023*, 47–66.

Sabatini, S., Brorsson, T. and Skoglund, P., 2020. Clay, Burial Urns, and Social Distinction in Late Bronze Age Southern Scandinavia. *In*: *Austvoll et al. 2020*, 233–245.

Sahlström, K.E., 1932. *Gudhems härads fornminnen*, Skövdeortens Hembygds- och Fornminnesförenings skriftserie 3. Skövde: Skövdeortens Hembygds- och Fornminnesförening.

Sahlström, K.E., 1939. *Valle härads fornminnen*, Skövdeortens Hembygds- och Fornminnesförenings skriftserie 4. Skövde: Skövdeortens Hembygds- och Fornminnesförening.

Skogstrand, L., 2020. The Contrasts Within. Intersecting Identities in the Lusehøj Mound, Denmark. *In*: *Austvoll et al. 2020*, 247–258.

Sjögren, K.-G., 2003. *"Mångfalldige uhrminnes grafvar…" Megalitgravar och samhälle i Västsverige*, GOTARC Series B 27, Coast to Coast 9.

Stilborg, O., 2002. Senneolitikum 2300–1800 f. Kr. *In*: A. Lindahl, D. Olausson and A. Carlie, eds. *Keramik i Sydsverige, en handbok för arkeologer*. Lund: Lund university.

Tornberg, A., 2017. Diet toothache and burial diversity. Tracing social status through bioarchaeological methods in Late Neolithic-Early Bronze Age Scania. *Lund Archaeological Review* 22, 21–36.

Tornberg, A., Svensson, A. and Apel, J., eds., 2022. *Life and afterlife in the Nordic Bronze Age. Proceedings of the 15th Nordic Bronze Age Symposium held in Lund, Sweden, June 11th–15th, 2019*. Lund: Lund University.

Vandkilde, H., 2016. Bronzization: The Bronze Age as Pre-Modern Globalization. *Praehistorische Zeitschrift* 91(1), 103–123. https://doi.org/10.1515/pz-2016-0005

Vandkilde, H., 2017. *The Metal Hoard from Pile in Scania, Sweden. Place, Things, Time, Metals, and Worlds Around 2000 BCE*. Aarhus: Aarhus University Press.

Weiler, E., 1994. *Innovationsmiljöer i bronsålderns samhälle och idévärld: kring ny teknologi och begravningsritual i Västergötland*. PhD thesis. Umeå: Umeå University.

Before Barrows – The Activity of Corded Ware Communities at the 'Princely Barrow' Cemetery in the Łęki Małe, Wielkopolska Region

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KEYWORDS: *Corded Ware communities, Únětice communities, funerary practices, flat graves, barrow cemetery, 3rd millennium BCE*

Abstract

The site at Łęki Małe, in the Wielkopolska (Greater Poland) region, is known primarily for the Únětice 'princely barrow' cemetery that existed here during the Early Bronze Age. However, the site area was in use both prior to and after the existence of the barrow cemetery itself. In this paper, we address the issue of the activity of Corded Ware communities in Łęki Małe. On the basis of the literature and unpublished materials stored in the Archaeological Museum in Poznań, two occupation phases can be related to the Corded Ware communities. First, between 2800–2500 BCE, they set up a small settlement or a camp with the material equipment related to the earliest Corded Ware phase in the Polish Lowland. The Corded Ware communities reappeared again at the final stage of their development in the region by setting up a small flat cemetery that can be dated back to the second half of the 3rd millennium BCE. Of key importance is the relationship between this flat burial ground and the Únětice barrow cemetery, which started at *c.* 2125 BCE. The authors hypothesise that the activities of Corded Ware and Únětice communities, hitherto treated as two separate phases of cemetery use, in fact comprised one sequence of funerary practices. It is likely, therefore, that Łęki Małe attests to the profound changes of the local community, which are indicated by the shift from the use of flat graves to the construction of barrows, however, while respecting the same space for burial practices.

Abstrakt

Stanowisko w Łękach Małych w Wielkopolsce jest znane przede wszystkim z unietyckiego cmentarzyska „kurhanów książęcych", istniejącego tu we wczesnej epoce brązu. Jednakże teren stanowiska był użytkowany zarówno przed powstaniem kurhanów, jak i później. W artykule podejmujemy zagadnienie obecności w Łękach Małych społeczeństw reprezentujących kulturę ceramiki sznurowej. Na podstawie literatury oraz w oparciu o niepublikowane materiały znajdujące się w zbiorach Muzeum Archeologicznego w Poznaniu zidentyfikowane zostały dwie fazy osadnicze związane ze grupami „sznurowymi". Najpierw, w okresie 2800–2500 p. Chr., założona została niewielka osada względnie obozowisko, a jej wyposażenie materialne odpowiadało najwcześniejszej fazie kultury ceramiki sznurowej na Niżu Polskim. Ponownie społeczności te pojawiły się tu w schyłkowym etapie swego rozwoju, tym razem zakładając niewielkie cmentarzysko złożone z grobów płaskich, datowane na drugą połowę III tys. p. Chr. Kluczowe znaczenie ma relacja między tym cmentarzyskiem a unietycką nekropolą kurhanową, której początek przypadał na ok. 2125 p. Chr. Autorzy stawiają tezę, że aktywności społeczności „sznurowej" i unietyckiej, traktowane dotychczas jako dwie odrębne fazy użytkowania cmentarzyska, w rzeczywistości składały się na jedną sekwencję praktyk funeralnych. Jest bowiem prawdopodobne, że w Łękach Małych mamy do czynienia z jedną społecznością lokalną, która w trakcie swojego trwania podlegała głębokim przeobrażeniom, co jest zaznaczone przez przejście od stosowania grobów płaskich do budowy kurhanów, jednakże przy respektowaniu tej samej przestrzeni funeralnej.

*Fig. 1. Łęki Małe, Wielkopolska region. Location of barrows and flat graves. **I–IV** barrows; **1–3** flat graves (Graphic: Marcin Ławniczak).*

INTRODUCTION

The site discussed here, referred to as Wilanowo 12 in the official nomenclature of the archaeological service, is known in archaeological literature as the 'Early Bronze Age cemetery of princely barrows' at Łęki Małe (Kowiańska-Piaszykowa 2008). The latter terminology will be used in this article.

Over the course of many years of investigations, the site has been found to have also been used at other times. Some occupation phases preceded the Early Bronze Age barrow cemetery, including settlements by post-Linear Pottery Culture, Funnel Beaker Culture (FBC) and Corded Ware Culture (CWC) populations. In turn, others followed it, for example, the traces of a sojourn of Lusatian populations during the Late Bronze Age, and remains left by La Tène, Early and Late Middle Age populations (Czebreszuk *et al.* 2024). This article shall discuss the relics of a CWC occupation, whose relationship to the Early Bronze Age barrows calls for some serious thought. The crucial question in this context is the origin of the cemetery with three flat graves (Kowiańska-Piaszykowa 1968, 7 fig. 2), located immediately north and northeast of Barrow IV — the oldest of the barrows built in the Early Bronze Age (Fig. 1).

This article is the second in the series of publications on the cultural context of the Únětice cemetery of 'princely barrows', following one on the remains of FBC population settlement (Szmyt and Czebreszuk 2022).

SOURCES

All we know about the traces left by CWC communities at Łęki Małe comes from relevant publications (collected in Kowiańska-Piaszykowa 2008) and the review of unpublished materials stored in the Archaeological Museum in Poznań (AMP), consisting for the most part of movable finds, in particular pottery. They have been collected together and comprehensively studied. Only two ground features, specifically Graves 1 and 3, located close to the barrows, have already been related to the CWC tradition earlier, but Grave 2, located near them, has not been linked until now to any cultural group.

Table 1. Łęki Małe, Wielkopolska region. Description of Corded Ware finds, published (after: Lipińska 1962 and Kowiańska-Piaszykowa 1968). Continued in Table 2.

ID	Inv. no.	Cat. no.	Barrow	Location	Depth [m]	Description	References	Fig.	CWC phase	Notes
1	1956:352	1956:1916	IV	Pavement, Quadrant I	3.8	Pottery: several fragments, incl. one "*decorated with a series of vertical cord imprints, bounded on one side by horiz. band*"; clay mass with admixture of sand and mica; wall thickness 5 mm	Kowiańska-Piaszykowa 1968, 15, 20	5.7	2	Same information repeated on p. 15 and 20 in Kowiańska-Piaszykowa 1968
2	1956:352	1956:1916	IV	Quadrant I; 1,2 NS 1,31 EW	2.1	Pottery fragm. "*decorated with a cord ornament in form of two horiz. parall. strands and diag. lines coming to them from both sides*"; clay mass with admixture of fine-grained crushed stone and sand; wall thickness 6 mm	Kowiańska-Piaszykowa 1968, 20	5.5	2	
3	1956:352	1956:1916	IV	Quadrant I		Pottery fragm. "*with ornament in form of horizontal and diagonal cord imprints forming triangles*"; wall thickness *c.* 5 mm	Kowiańska-Piaszykowa 1968, 20 fig. 36.2	-	2	Missing in the AMP collection
4	1957:373	1957:1094	IV	Quadrant I	2.0	Pottery fragm.: "*an upper part of a large vessel, decorated on the neck and edges with wavy moldings shaped with finger impressions*"; clay mass with admixture of very thick chamotte and fine sand; grey in cross-section, both surfaces unlevelled, inner surface additionally burnished; wall thickness 11 mm	Kowiańska-Piaszykowa 1968, 20 fig. 36.3	4.10	1	
5	1956:352	1956:1917	IV	Quadrant I		The hearth-shaped arrowhead from the erratic Baltic flint*	Kowiańska-Piaszykowa 1968, 20 fig. 36.1	5.1		* Expertise of Prof. Iwona Sobkowiak-Tabaka
6	1956:353	1956:1919	Grave 1		0.33–0.85	Pottery fragment: a fragment of a vessel with the base of the tape-shaped handle on the passage of the neck and belly; clay mass with small amount of medium-grained crushed stone and a small amount of fine chamotte; an outer surface brown, an inner surface dark gray; cross-section dark gray; wall thickness 9 mm	Kowiańska-Piaszykowa 1968, 21 fig. 39.1	6.3	2	Alternatively: Únětice or Decline Neolithic/ CWC
7	1956;353	1956:1919	Grave 1		0.33–0.85	Pottery fragment: a fragment of a large undecorated vessel; clay mass with small amount of medium-grained crushed stone and a small amount of fine chamotte; both surfaces and a cross-section orange; wall thickness 10 mm	Kowiańska-Piaszykowa 1968, 21 fig. 39	6.2	2	Alternatively: Únětice or Decline Neolithic/ CWC
8	1974:374	1957:1096	Grave 3		0.20–0.95	A vessel decorated with cord ornament; wall thickness 5 mm	Lipińska 1962, fig. 4	6.7	2	
9	1974:374	1957:1095	Grave 3		0.20–0.95	Stone axe made of diabase	Lipińska 1962, fig. 5	6.6	2	

Publications mentioned CWC materials from Barrow IV and the flat grave cemetery near the barrows (Lipińska 1962; Kowiańska-Piaszykowa 1968). The published sources refer to (Table 1) ceramics (at least four sherds) and a flint arrowhead found during the exploration of Barrow IV, but only in its Quadrant I,

Table 2. (double page, continued on the following pages) Łęki Małe, Wielkopolska region. Description of Corded Ware finds (previously unpublished).

ID	Inv. no.	Cat. no.	Barrow	Location	Depth [m]	Pottery
						technolog. features
10	1957:371	1957:1068	IV	At the skeleton 2, Quadrant I; 12.65 m from NS-axis and 1.00 m from EW-axis	3.66–3.99	Without mineral admixture; outer surface burnished
11	1956:350	1956:1895	IV	Cluster 1, Quadrant I; 9.8 m from EW-axis and 0.6 m from NS-axis	3.89	Clay mass with large amount of fine- and medium-grained crushed stone; outer surface burnished, inner surface smooth but very unlevelled; wall thickness 12 mm
12	1956:350	1956:1895	IV	Cluster 1, Quadrant I; 9.8 m from EW-axis and 0.6 m from NS-axis	3.89	Clay mass with admixture of chamotte; wall thickness 10 mm
13	1956:351	1956:1902	IV	Quadrant III, from the embankment		Clay mass with admixture of large particles of chamotte; both surfaces unlevelled but smooth, gray; cross-section gray; wall thickness 9 mm
14	1956:351	1956:1902	IV	Quadrant III, from the embankment		Clay mass with large amount of admixture of coarse-grained crushed stone; both surfaces very unlevelled but not burnished, inner surface brown, outer surface brownout; cross-section red; wall thickness 6 mm
15	1956:351	1956:1902	IV	Quadrant III, from the embankment		Clay mass with large amount of coarse-grained crushed stone; both surfaces very unlevelled but not burnished, inner surface brown, outer surface dark brown; cross-section red; wall thickness 7 mm
16	1956:351	1956:1902	IV	Quadrant III, from the embankment		Without admixture of crushed stone; both surfaces burnished; wall thickness 9 mm
17	1956:351	1956:1902	IV	Quadrant IV, from the embankment	4.30	Clay mass with large amount of coarse-grained crushed stone; outer surface unlevelled, smooth, inner surface levelled, smooth, both surfaces orange; cross-section orange; wall thickness 7 mm
18	1956:351	1956:1902	IV	Quadrant IV, from the embankment	3.88	Clay mass with large amount of coarse-grained crushed stone and chamotte; both surfaces unlevelled, smooth, gray; cross-section dark gray; wall thickness 8 mm
19	1956:351	1956:1902	IV	Quadrant IV, from the embankment; 1(?).70* m from NS-axis and 20.25 m from EW-axis	4.23?	Clay mass with large amount of crushed stone; outer surface is smoothed, unlevelled, inner surface smoothed, levelled, both surfaces orange; cross-section brown; wall thickness 9 mm
20	1956:353	1956:1919		Grave 1		Clay mass with small amount of medium-grained crushed stone and a small amount of fine chamotte; an outer surface brown, an inner surface dark gray; cross-section dark gray; wall thickness 9–10 mm
21	1956:353	1956:1919		Grave 1		Clay mass with small amount of fine sand and crushed stone; both surfaces levelled and smooth, beige; cross-section beige/dark-gray; wall thickness 9 mm
22	1956:353	1956:1919		Grave 1		Clay mass with small amount of fine sand and crushed stone; both surfaces levelled and smooth, orange; cross-section dark-gray; wall thickness 3–4 mm
23	1956:352	1956:1916	IV	Quadrant I, from the embankment; 1.2 m from NS-axis, 1.31 m from EW-axis	2.1	Clay mass with admixture of fine sand and mica; both surfaces levelled and smooth, beige; wall thickness 4 mm

i.e. the northwestern one (Kowiańska-Piaszykowa 1968, 20), as well as a vessel and a stone shaft-hole axe from Grave 3 (Lipińska 1963) and — albeit with some doubts — two ceramic sherds from Grave 1 (Kowiańska-Piaszykowa 1968, 21 and fig. 39).

Pottery stylistic features	Typo-chronology	Phase of CWC	Notes	Figure
	CWC	1		-
Bottom of a large vessel	Late CWC, settlement version	2	Kowiańska-Piaszykowa 1968, fig. 18	5.11
	Early CWC	1		-
Large S-profile pot; vessel rim of type 1e	Early CWC	1		4.5
Vessel rim of type 1e	Late CWC	2	Crumbling piece	5.12
Vessel rim of type 1k	Late CWC	2	Crumbling piece	5.13
	Early CWC, settlement version	1		4.7
Vessel rim of type 1e	Late CWC, settlement version	2		5.2
	CWC	?		-
	Late CWC	2	* Unclear description on the shard	-
	Late CWC/Decline Neolithic	2	Technological features y very similar to ID 6 and 7, but another vessel	-
	Early Bronze Age of the Únětice type	2	Fragment of a large vessel	-
Fragment of a cup?	CWC with influences of Bell Beakers	2	Three fragments of one vessel	-
Two horizontal cord lines	Late CWC	2		5.4

Table 2. (double page, continuation).

ID	Inv. no.	Cat. no.	Barrow	Location	Depth [m]	Pottery technolog. features
24	1957:373	1957:1094	IV	Quadrant I, from the embankment		Clay mass with large amount of medium-coarse crushed stone with mica; both surfaces beige; cross-section gray; wall thickness 6 mm
25	1956:351	1956:1902	IV	Quadrant II, from the embankment; 0.25 m from NS-axis and 18.6(?)* m from EW-axis		Clay mass with admixture of coarse-grained chamotte and fine sand; both surfaces burnished, outer more clearly; wall thickness 8 mm
26	1956:351	1956:1904	IV	Quadrant I, from the embankment; 2.8 m from NS-axis and 1.1 m from EW-axis	3.94	Clay mass with medium-grained crushed stone and chamotte, and fine sand; mica visible on the surface; both surfaces and cross-section gray; wall-thickness 7 mm
27	1957:372	1957:1088	IV	From the embankment		Clay mass with large amount of medium-grained crushed stone and fine sand; both surfaces levelled, brown; cross-section gray; wall thickness 7 mm
28	1956:351	1956:1907	IV	Quadrant IV, from the embankment		Clay mass with admixture of chamotte and sand; outer surface burnished; inner levelled; cross-section bicolored (black and grey); wall thickness 8 mm
29	1957:372	1957:1088	IV	From the embankment		Clay mass with medium- and coarse-grained chamotte; both surfaces burnished; cross-section gray; wall thickness 7–8 mm
30	1957:372	1957:1088	IV	From the embankment		Clay mass with large amount of medium-grained crushed stone; both surfaces levelled, brown; cross-section black; wall thickness 6 mm
31	1955:236	1955:722	III	From the embankment		Clay mass with admixture of very fine chamotte and sand; wall thickness 6 mm
32	1956:236	1955:722	III	From the embankment		Clay mass with very large amount of medium-grained chamotte; both surfaces unlevelled, brown; cross-section black; wall thickness 7 mm
33	1957:372	1957:1088	IV	From the embankment		Clay mass with admixture of fine crushed stone and sand; both surfaces levelled and brown; cross-section gray; wall thickness 12 mm
34	1955:236	1955:722	III	From the embankment		Clay mass with admixture of fine chamotte; outer surface brown, inner surface gray; cross-section gray; wall thickness 6 mm
35	1955:236	1955:722	III	From the embankment		Clay mass with large amount of medium-grained chamotte; outer surface brown, inner surface gray, both levelled; cross-section gray; wall thickness 9 mm
36	1956:351	1956:1902	IV	Quadrant I, from the embankment; 2.8 m from NS-axis and 4.0 m from EW-axis	1.0	Clay mass with large amount of medium-grained crushed stone; outer surface smooth, inner surface levelled, smooth; cross-section dark gray; wall thickness 8-9 mm
37	1956:351	1956:1902	IV	Quadrant II, from the embankment	4.13	clay mass with an admixture of sand; wall thickness 10 mm

The re-analysis of the material in the museum collection (Table 2) showed that there were more CWC-related artefacts, with most indeed coming from Barrow IV, but not only from Quadrant I. Moreover, it re-affirmed the identification of CWC ceramics made in older literature, but identified that twenty-eight more sherds belong to the CWC that had until then been described as Neolithic or associated with the FBC. Twenty-one fragments were recorded in all the quadrants of Barrow IV: Quadrant I yielded seven sherds, Quadrant II – two, Quadrat III – four and Quadrant IV – four as well; in addition, four more sherds were extracted from the mound in general.

Pottery stylistic features	Typo-chronology	Phase of CWC	Notes	Figure
Potty cup with plastic strip under rim	Decline Neolithic/ Early Bronze Age phase of CWC	2		5.3
Large vessel	Early CWC	1	* Unclear description on the shard	4.9
Cup (?) with a short stick-on strip on the neck	Decline Neolithic/ Early Bronze Age phase of CWC	2		5.8
Cup (?) with a short stick-on strip on the neck	Decline Neolithic/ Early Bronze Age phase of CWC	2		5.9
	Early CWC, settlement version?	1	Alternative: FBC	4.6
	Early CWC, settlement version?	1	Alternative: FBC	4.8
Small bowl;	Late CWC	2	Crucible? (but no traces of fire)	5.6
Vessel rim of type 11e	Early CWC	1		4.3
Cup decorated with lines carved from above and below closed with slanted posts	CWC	?		4.1
S-profile cup	CWC?	2?		5.10
Large vessel with an S-profile with a nodule at the transition between the neck and the belly of the vessel	Early CWC	1		4.4
Fragment of a handle	CWC?	?		-
The vessel rim of type 1c; under the rim a plastic strip with finger imprints	CWC	?		4.2
large storage vessel	CWC?	?		-

A new discovery of four CWC sherds was made in material from Barrow III. Besides the two mentioned barrows, CWC pottery came not only from Grave 3, but also from Grave 1 in which three further sherds were identified, different from those described in older literature (Kowiańska-Piaszykowa 1968, 21).

In total, the assemblage of CWC artefacts from Łęki Małe is comprised of 37 artefacts: one clay vessel, thirty-four pottery sherds as well as single flint and stone finds (Table 3).

Table 3. Łęki Małe (Wilanowo, site 12), Wielkopolska region; Corded Ware finds.

Location		Ceramics (fragments or intact vessels)	Flint	Stone	Notes
Barrow IV	Quadrant I	11	1*		* An arrowhead
	Quadrant II	2			
	Quadrant III	4			
	Quadrant IV	4			
	generally from the barrow	4			
Barrow III		4			
Grave 1		5			
Grave 3		1*		1**	* A reconstructed vessel ** An axe from diabase
Total		**35**	**1**	**1**	

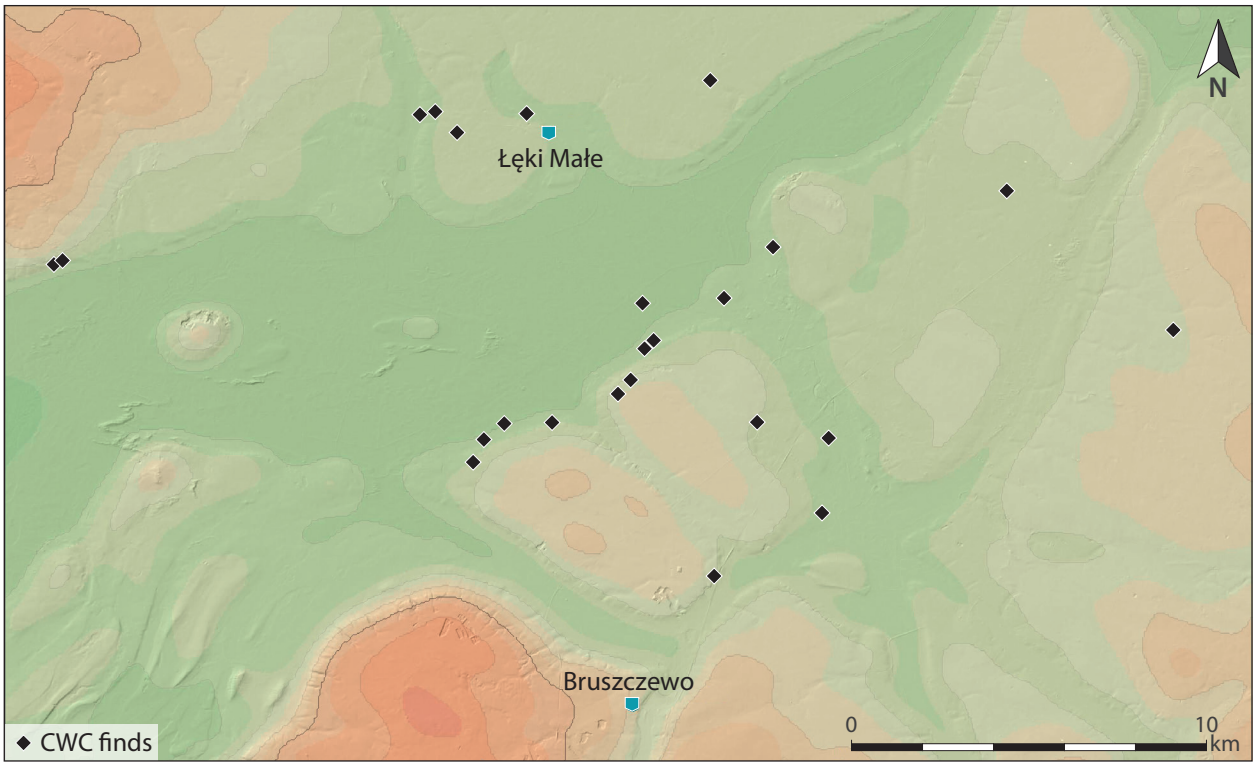

Fig. 2. Łęki Małe on the background of the regional context of Corded Ware finds (Graphic: Marcin Ławniczak).

MICRO-REGIONAL CONTEXT

As a context for the presentation of the CWC finds, an area in the middle of the Obra drainage basin, measuring 35 × 25 km, was selected (Fig. 2). It covers the vicinity of Łęki Małe in the north and Bruszczewo in the south. In this area, over many stages of investigations, twenty sites were discovered at a considerable distance from one another (Czebreszuk and Szydłowski 2010, 84 fig. 4; Szydłowski 2013, 138 fig. 16 and 21). Most of them yielded from one to five pottery sherds, with the most spectacular find still being Grave 3 from Łęki Małe (Pospieszny 2009, Catalogue, item 21).

The latest archaeological surveys, conducted from 2016–2018, have covered a terrain form that is clearly geomorphologically marked and bounded by the Obra Marginal Stream Valley (in the south and southeast), the Mogilnica River (in the east and northeast) and the Grabarski Canal (in the West). At its eastern end, the cemetery of Łęki Małe is located. The methodology of

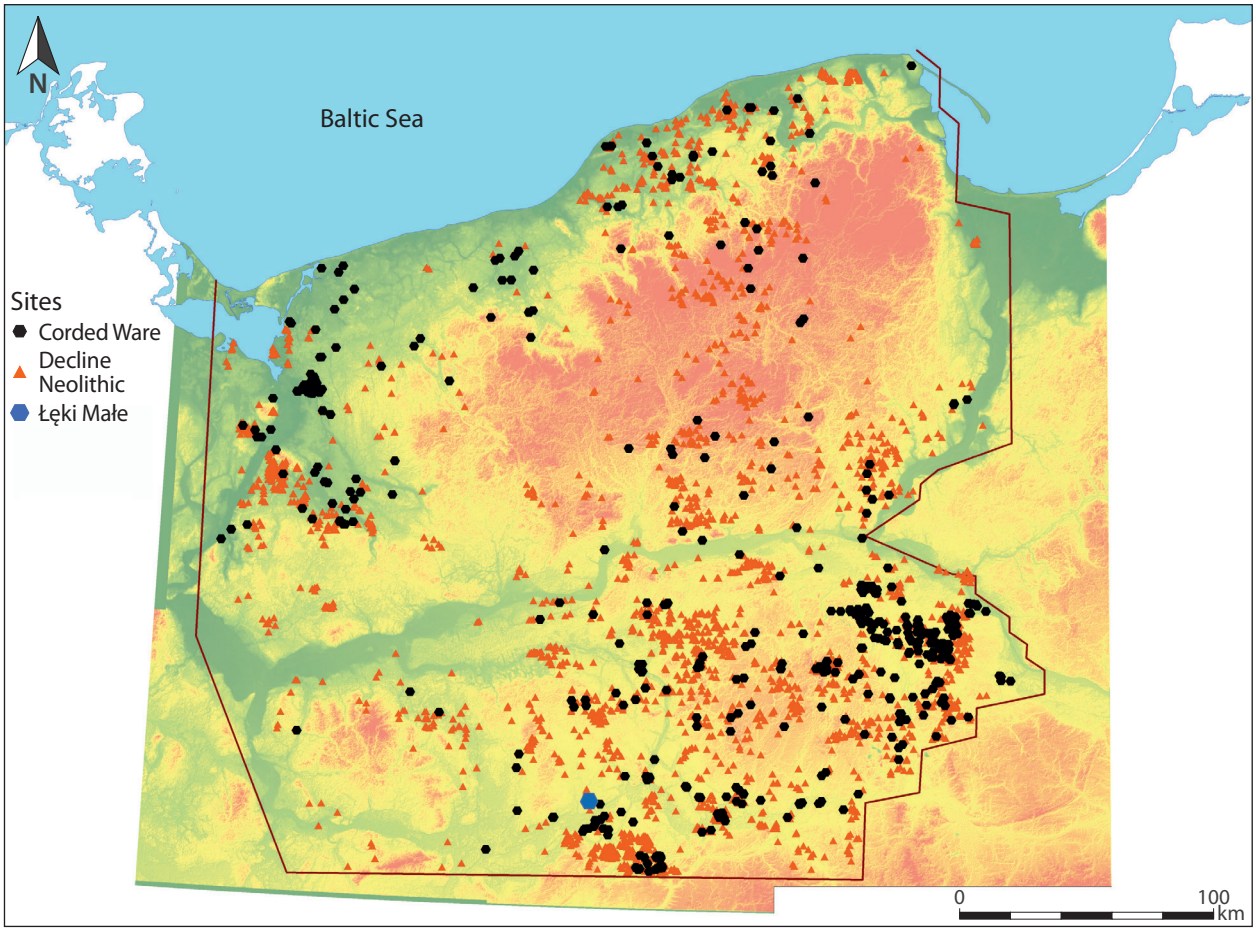

Fig. 3. Łęki Małe on the background of the macroregional context of Corded Ware and Decline Neolithic sites (after Ławniczak in press.; graphic: Marcin Ławniczak).

the surveys was geared to collect surface material as thoroughly as possible and to locate every artefact as accurately as possible. With respect to the CWC, the results of these intensive surveys have proven meagre: single ceramic sherds were only found at four locations.

All the information that has been collected indicates that CWC occupation has left few traces in the vicinity of Łęki Małe (Fig. 2). It appears, therefore, that CWC communities on the Middle Obra River concentrated their activities south of the marginal stream valley, where more of their traces have been found. A similar picture of spatial organisation is recorded with respect to the Early Bronze Age settlement (Czebreszuk *et al.* 2024).

In turn, on a still broader geographic scale, covering northwestern Poland (Czebreszuk *et al.* 2019, 820 plate 3), Wielkopolska, and in particular Kujawy, there are regions where CWC traces are noticeably concentrated in the remains of the Neolithic decline (2500–2200 BCE) and the Early Bronze Age, which clearly differentiates the two regions from adjacent ones (Fig. 3).

SOURCE ANALYSIS

The review of older publications and archival data stored in AMP led to the conclusion that not a single feature had been recorded within the barrows that could be an effect of activities by CWC communities. Such remains can only be considered for two graves located next to Barrow IV, designated as Graves 1 and 3. Hypothetically, they could be joined by Grave 2 in which, however, no artefacts were present. They shall be discussed below (cf. Section 4.2). However, movable finds shall be discussed first as their distribution gives a spatial and chronological context for graves.

Movable finds

Within Barrow IV, CWC artefacts are concentrated in Quadrants I, III and IV, with Quadrant II yielding only two pottery sherds (Table 1 and 2). Where data on depth is available, CWC artefacts are known to have been deeply buried; they were found at a depth of about 3.66–4.30 m below the barrow top. This shows that they do not come from the mound, but from the original humus or ground surface. Only in four cases were pottery sherds found in the mound (depth 1.0–2.1 m), *i.e.* in a secondary context.

The technology and style of the pottery at Łęki Małe can be clearly split into two groups, indicating that the activities of CWC communities on the site had two distinct phases. Only five ceramic sherds (ID: 18, 32, 35, 36 and 37) were so indistinct that they could be only generally classified as CWC (Fig. 4.1–2).

The first group (Fig. 4.3–10) is comprised of vessels with a matrix without the admixture of crushed stone, but tempered with lots of grog (including a coarse-grained one) and sometimes fine sand. Their outer surfaces are often burnished and sometimes bear incised ornaments (ID 31). Large 'baggy' vessels display wavy mouldings shaped with finger impressions (ID 4). In this group, sherds of the following IDs are included: 4, 10, 12, 13, 16, 25, 28, 29, 31, 34 (Table 1 and 2).

The second group (Fig. 5.2–13; 6.7) is made up of vessels whose matrix was tempered with crushed stone of varied coarseness: ID: 1, 2, 3, 6, 7, 8, 11, 14, 15, 17, 19, 20, 21, 22, 23, 24, 26, 27, 30, 33? (Table 1 and 2). They usually have complex cord-impressed motifs (ID: 1, 2, 3, 8, 23) and have grips or handles (ID: 26, 27, 33?) and straight horizontal mouldings (ID 24).

In terms of typo-chronology, the first group may be assigned to the early phase of the CWC (in Kujawy: CWC 1 according to Czebreszuk 1996; see also Kurzawa 2001), dated to *c.* 2800–2500 BCE. The second group, in turn, represents the youngest CWC phase (in Kujawy: CWC 4 according to Czebreszuk 1996) that coincided with the period from 2500–2000 BCE (Czebreszuk *et al.* 2000, 570 Fig. 1; Pospieszny 2009).

Łęki Małe is not the only site where traces were found from several occupation phases of CWC communities. A similar composition of the techno-stylistic traits of pottery was identified, for instance, on the site Lutol Stary, Trzciel Commune, located on the Lower Obra River on the borderland between Wielkopolska and the Lubusz Land (Czebreszuk and Szmyt 2012). This is a site with a long settlement sequence, covering the entire lifetime of the CWC. (2800–2200 BC). It began with an early phase, which was recorded both in pottery technology based on clay matrix without crushed stone temper, as well as in vessel ornamentation with horizontal mouldings covered by finger-impressed dents (Czebreszuk and Szmyt 2012, 99 fig. 12.3, 19.12, 20.1, 2). In turn, the final stages of the CWC (already of Early Bronze Age chronology) were characterised by pottery with complex corded ornaments (Czebreszuk and Szmyt 2012, 84 fig. 8.2, 9.2, 13.2, 16.5, 18.3) and the presence of grips on necks (Czebreszuk and Szmyt 2012, 84 fig. 8.2, 4, 5, 17.9).

The cemetery of flat graves outside of barrows

In the cemetery at Łęki Małe, outside of the barrows, three flat graves were recorded and designated as Graves 1, 2 and 3 (Fig. 1). They were arranged in a line, with Grave 1 located approximately 7.0 m to the NE of Barrow IV, Grave 2 approximately 50.0 m NW of Grave 1, and Grave 3 approx. 15.0 m NW of Grave 2 (Fig. 1). They show many structural similarities. They are rectangular in shape and measured 2.0/1.8 × 1.2/1.28 m with a depth of 0.6–0.96 m (Table 4). The ceilings of all the graves were destroyed by ploughing. Each of their fills held the remains of stone structures, but none contained any bones. However, they differed in orientation: Grave 1 was oriented N-S, Grave 2 was oriented W-E and Grave 3 was oriented NE-SW. Only the grave goods in the latter grave, a vessel and a shaft-hole axe made of diabase, were distinctive enough (Fig. 6.6–7) to identify them unambiguously as from the Late CWC tradition (Lipińska 1962; Pospieszny 2009). The closest analogy comes from the presumed grave at Dębołęka, Piotrków Kujawski Municipality, in the borderland between Kujawy and Wielkopolska (Czebreszuk 1996, 107 fig. 25). The objects found in it closely resembled finds from Grave 3 at Łęki Małe: a 'Wkrzański-type' shaft-hole axe and a vessel — a handleless amphora — almost identical to the vessel in Grave 3 with the same corded ornament on the neck and upper belly. On both vessels, the motif of 'filled triangles' made with cord impressions is observed. It is most characteristic of the CWC group in the Saale and Middle Elbe drainage basins (Buchvaldek 1986, 27). A similar ornament was borne by a flowerpot vessel from a barrow-covered grave in Ciechrz, Kujawy (Czebreszuk 2000, 443 fig. 11.8). A rich assemblage of similarly ornamented vessels is also known from Siniarzewo, Kujawy (Czebreszuk 2000, 440 fig. 8.2–4). All the named finds are assigned to the CWC 4 phase in Kujawy.

Grave 1 goods (Fig. 6.2–3; Table 2), in turn, show a set of traits having more general (only technological) affinities with the Decline Neolithic, the Late CWC,

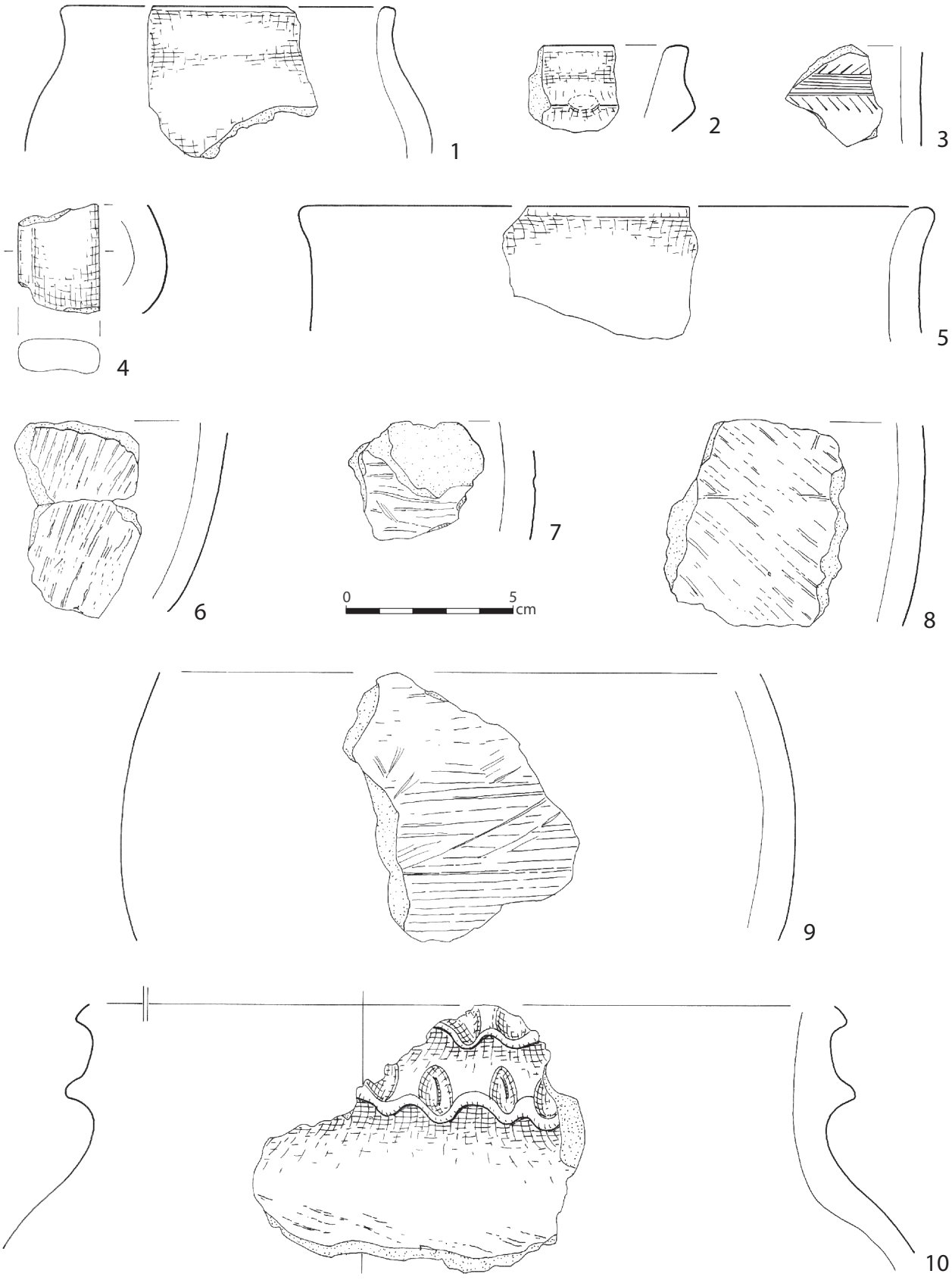

*Fig. 4. Łęki Małe. **1–2** Pottery related generally to the CWC and **3–10** to its early phase (Graphic: Jolenta Kędelska).*

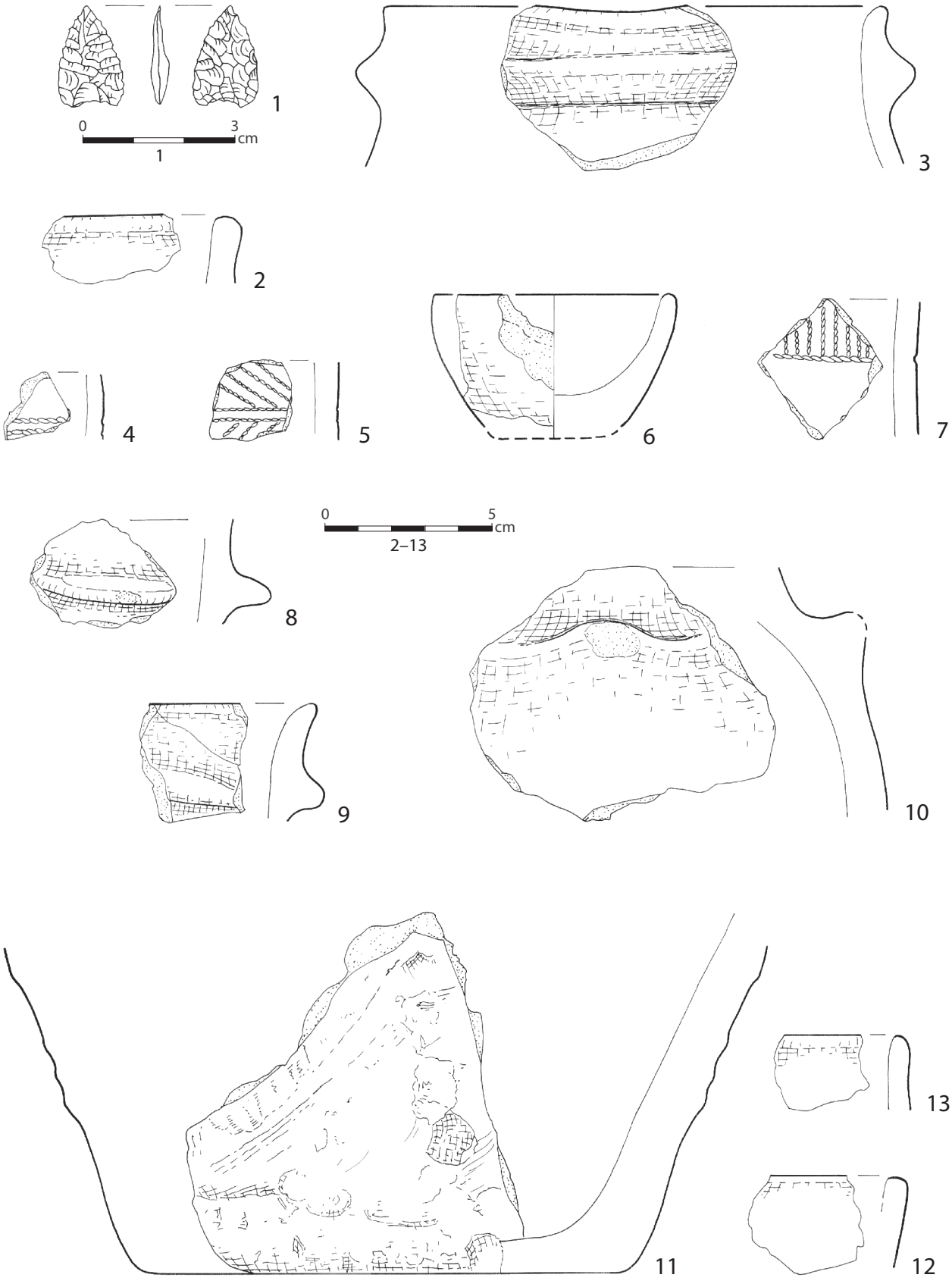

*Fig. 5. Łęki Małe. **1** Flint arrowhead and **2–13** pottery related to the late phase of the CWC (Graphic: Jolenta Kędelska).*

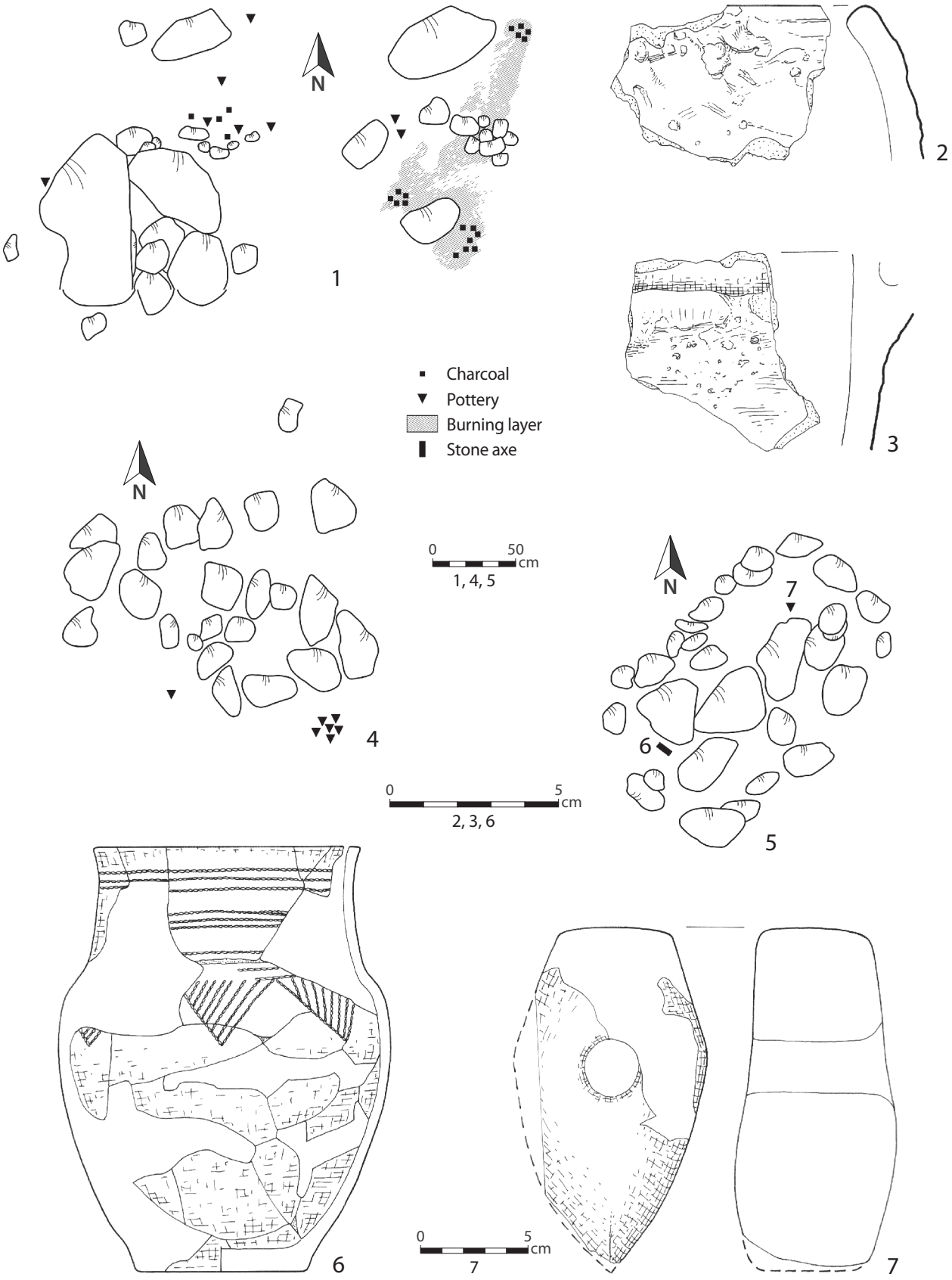

*Fig. 6. Łęki Małe. Flat graves of the CWC: **1–3** grave 1, **4** grave 2 and **5–7** grave 3 (partly after: Lipińska 1962 and Kowiańska-Piaszykowa 1968; graphic: Jolenta Kędelska).*

Table 4. Łęki Małe, Wielkopolska region. Main features of flat graves.

Grave	Dimensions [m]	Main axis	Depth [m]	Form of the grave	Preservation of bones	Notes	References
1	1.20 × 2.00	N-S	0.33–0.85	Construction made of stone arranged on the irregular rectangular plan: in the upper part large (one of them is 1 m in length) and middle pieces, in the lower part middle and small ones; in the southern portion of the upper part stones compactly arranged, in other portions more dispersed.	no information	In the lower part, a layer of burning has been recorded; the upper part was destroyed by ploughing. Charcoals found in the upper part are dated to the first half of the 1st mill. BCE.	Kowiańska-Piaszykowa 1968, 21 fig. 38 and 39, plate 4.4
2	1.80 × 1.28	W-E	0.20–0.60	Construction made of stones (middle and small) arranged on the irregular rectangular plan.	no bones found	The upper part was destroyed by ploughing.	Kowiańska-Piaszykowa 1968, 21 fig. 40
3	1.20 × 1.90	NE-SW	0.20–0.95	Construction made of stones (middle and small) arranged on the regular rectangular plan, with bigger pieces in the middle and smaller ones around them.	no bones found	The upper part was destroyed by ploughing.	Lipińska 1962

Bell Beakers and the (Early?) Únětice Culture. Therefore, this grave most likely dates back to the beginnings of the Early Bronze Age, but its structure and some ceramics found in it point to its roots in the Decline Neolithic of which the CWC tradition is characteristic. That the tradition must have been vital at that time is also seen in the remnants of stone structures, which are very frequent in CWC graves in Kujawy and Wielkopolska (Pospieszny 2009, 105–106 table 3).

A clear cultural and chronological interpretation of the Łęki Małe flat graves is not easily facilitated by the differences in orientation of particular graves. It is worth stressing, however, that Graves 1 and 3 were oriented along the axes that were the most popular with the regional CWC variety: N-S and NE-SW (Pospieszny 2009, 105–106 table 3).

The set of typo-chronological assessments above leads to the conclusion that the three graves represent one tradition (a Decline Neolithic community of an Early Bronze Age chronology) and at the same time reveals its temporal dynamics: Grave 3 is the oldest (with pottery still in the style of the youngest CWC stages), while Grave 1 is the youngest (lacking most CWC traits). In comparison, the least amount of information is available for Grave 2 (without grave goods), but the similarity of structural characteristics supports the hypothesis about its intermediate position in the spatial-temporal sequence of the flat grave cemetery at Łęki Małe.

The question of Grave 1 radiocarbon dating

In AMP storage, a sample has been preserved (catalogue no. 1956:1919a), described as "Grave 1, hearth outside barrow". Any information on the depth from which it was collected is lacking. The source publication says that charcoals were only found in the surface layer of Grave 1 (Kowiańska-Piaszykowa 1968, 21). Admittedly, in its bottom or floor layer, an "intermittent layer of char" was recorded (Kowiańska-Piaszykowa 1968, 21 fig. 38), but there is no information about the presence of charcoals there. Hence, the stratigraphic position of the sample is hard to determine. Nevertheless, it was subjected to an anthracological analysis (identification: birch, *Betula* sp.) and radiocarbon dating (Poz-96953 2485±35 BP).

The dating value (Fig. 7.1) places the age of the sample in the first half of the 1st millennium BCE (the dating interval partially overlaps the 'Hallstatt Plateau', which considerably limits the dating accuracy). Since there are some materials available attesting to Early Iron Age settlement within the mound circumference of Barrow IV (Kowiańska-Piaszykowa 1968, 20 fig. 37), it is acceptable to presume that the entailed activity also covered the area adjacent to Barrow IV. It is thus likely that a hearth was placed over Grave 1 in the first half of the 1st millennium BCE and that the examined sample dates the younger strata within this stratigraphic arrangement. Thus, it does not refer to the CWC context.

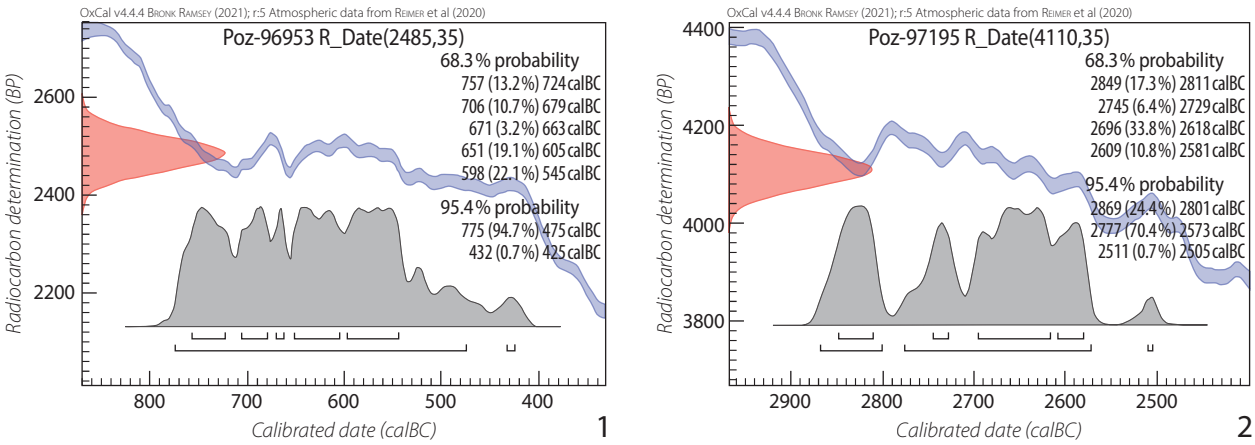

Fig. 7. Łęki Małe. Calibration of radiocarbon datings of samples from the close vicinity of **1** *grave no. 1 and* **2** *"pavement XIX" in Barrow III. Prepared in OxCal v4.4.4 (after Bronk Ramsey 2021).*

Table 5. Łęki Małe, Wielkopolska region. Typo-chronological division of Corded Ware pottery.

Location	Phase 1	Phase 2	?	Total
Barrow IV, Quadrant 1	ID 4, 10, 12	ID 1, 2, 3, 11, 23, 24, 26	ID 36	**11**
Barrow IV, Quadrant 2	ID 25		ID 37	**2**
Barrow IV, Quadrant 3	ID 13, 16	ID 14, 15		**4**
Barrow IV, Quadrant 4	ID 28	ID 17, 19	ID 18	**4**
Barrow IV, in general	ID 29	ID 27, 30	ID 33	**4**
Barrow III	ID 31, 34		ID 32, 35	**4**
Grave 1		ID 6, 7, 20, 21, 22		**5**
Grave 3		ID 8		**1**
Total	**10**	**19**	**6**	**35**

INTERPRETATION

The site of the Łęki Małe barrow cemetery was used by CWC communities at least twice (Table 5).

The first occupation had a settlement character and was related to the earliest CWC phase on the Polish Lowland (2800–2500 BCE). The few remains it left behind, such as ten pottery sherds, were recorded *in situ* where later Barrow IV was erected a few centuries later. This is shown by the level on which the pottery sherds were buried that formed Cluster 1 underneath the mound (Kowiańska-Piaszykowa 1968, 13). Part of the pottery of the Early CWC was buried in the mounds of Barrow III and Barrow IV. One may thus hypothesise that the settlement or the camp of an Early CWC community was at least partly located on the area where Barrow IV was later erected and that soil from the area of the settlement/camp was used to erect Barrows III and IV. As already mentioned, no ground features related to the settlement have been recorded in the area nor is there any chance to obtain an absolute date due to the absence of any organic material. Nevertheless, indirect chronological data can be used for this purpose. It so happens that in the rich series of radiocarbon dates obtained lately for the Łęki Małe barrows (Czebreszuk *et al.* 2024), there is one date that is significantly older than the others: Poz-97195 4110±35 BP (Fig. 7.2). It comes from Barrow III and has been obtained for a sample of charcoals (oak, *Quercus* sp.) collected from the level of so-called "Pavement XIX" in Grave A (in fact it was the debris of the stone structure of the main grave located under the mound; see Czebreszuk *et al.* 2024). The calibration of Poz-97195, even after allowing for the hypothetical age of the oak from which the charcoals came (Czebreszuk *et al.* 2024, 27 fig. 12), is specified to 2800–2500 BCE and is consistent with the typo-chronological assessment reported above. It is thus likely that the dated charcoals were in some way connected to the oldest group of CWC settlers at Łęki Małe.

After a break of several hundred years, on the site, a flat grave cemetery was set up in which the funerary rite was characteristic of the youngest CWC phase. The oldest grave in this cemetery was Grave 3, while Grave 1 was the youngest. In typo-chronological terms, Grave 3 represented the youngest phase in Kujawy (CWC 4) and Wielkopolska, dated roughly to 2500–2000 BCE (Czebreszuk *et al.* 2000, 570 fig. 1). Grave 1, in turn, kept to the CWC funerary rite, but its ceramic furnishings visibly started to lose the traits of this tradition, which is seen in the absence of cord ornaments and connections to the Bell Beakers and Early Bronze Age traditions.

Since the time of Barrow IV erection is precisely set to *c.* 2125 BCE (Czebreszuk *et al.* 2024), there is no doubt that the time gap between Grave 1 and Barrow IV was not large. On the contrary, it is very likely that when Barrow IV was being built, the flat grave cemetery, in particular Grave 1, was still a visible element in the local ritual landscape (cf. Kowiańska-Piaszykowa 1968, 26). The CWC cemetery, therefore, must have been taken into account when choosing the place for the barrow. Was it merely an accident involving a group of 'Únětice' newcomers who built their first barrow (inaugurating a cemetery) exactly next to the youngest CWC grave? It seems very unlikely. A more probable hypothesis is that Barrow IV was built close to Grave 1 because of a conscious decision to continue the funerary tradition begun by older features in that place. This hypothesis is supported by single finds related to the Late CWC phase on the original surface designated for barrows (Table 5; Fig. 5.2, 8, 11).

At this juncture, the history of barrow raising ought to be discussed. Barrow raising was practiced in both traditions: the Únětice Culture and the CWC (Czebreszuk 2022). In the CWC, barrows were built especially in early phases, *i.e.* from 2800–2600 BCE (Włodarczak 2017, 294–295), but with time they were built less and less often and after 2400/2300 BCE they ceased to be built altogether in favour of cemeteries of flat graves or graves sunk into the mounds of older barrows (Włodarczak 2017, 295). On the Polish Lowland, one of the youngest CWC barrows is located on Site 25 at Ciechrz, already mentioned above. The barrow remains discovered there, assigned to phase CWC 4, are radiocarbon dated to *c.* 2450–2280 BCE (Kiev-6228 3900±35 BP; Czebreszuk 2000, 431–432 fig. 4, 11.4–8). Later, the most frequent Corded Ware burial form became single graves sunk into existing barrows or the establishment of flat grave cemeteries. In the Únětice circle, in turn, the idea of raising barrows over the graves of prominent members of a community began to materialise after 2150 BCE. Actually, according to what is known now, barrow raising began in the northern group at the earliest, with the best example being Barrow IV at Łęki Małe (Czebreszuk *et al.* 2024).

Thus, albeit the general knowledge about funerary rite changes in both CWC and Únětice communities, the hypothesis about the relative temporal proximity of both funerary forms recorded at Łęki Małe is supported: a flat grave cemetery and Barrow IV, the oldest on this site.

CONCLUSIONS

The above results shed new light on the history and dynamics of the use of the area at Łęki Małe, where a barrow cemetery was set up at *c.* 2125 BCE and where CWC had appeared twice in the 3rd mill. BCE. Between 2800 and 2500 BCE, the first group of settlers set up a short-lived settlement/camp there, the material furnishings of which corresponded to the earliest phase of the CWC (CWC 1; Czebreszuk 1996). Such settlements are characterised by a small size, absence of subsurface features and very sparse material remains, which were, as a rule, limited to a few pottery sherds (Czebreszuk and Szmyt 2008, 237–238).

An entirely new interpretation is necessary to make sense of the activities by communities representing the late phase of the CWC, roughly dated between 2500 and 2000 BCE. They inaugurated the use of space for funerary practices, which stood out from the local landscape (Czebreszuk *et al.* 2024). This use was later continued by the builders of Únětice barrows.

Until recently, activities of Late CWC and Early Únětice communities were considered to be two separate phases of cemetery use (Czebreszuk *et al.* 2024), but in reality, they made up a single sequence of funerary practices, commencing after 2500 BCE (Czebreszuk *et al.* 2000) and continuing until *c.* 1800/1775 BCE (Czebreszuk *et al.* 2024). It is thus very likely that the artefacts and remains found at Łęki Małe were left by a local community that underwent deep transformations during its lifetime. For instance, it shifted from burying their prominent dead in flat graves to covering them with barrows. This cultural or rather ideological turning point took place at *c.* 2125 BCE at the latest when the members of the community stopped following the CWC tradition and adopted Únětice practices.

A broadly similar transition to that of the Łęki Małe site was revealed by investigations in the Lech River Valley, Bavaria. There, too, a cultural transition was recorded: from the Bell Beakers to the Early Bronze Age tradition. The shift, reflected in palaeogenetic and ar-

chaeological data, occurred in one related and multigenerational group of people (Mittnik *et al.* 2019). However, their cultural transition did not involve a change of the funerary rite: they continued to bury their dead in flat cemeteries. In contrast, at Łęki Małe, we are faced with a revolution within the local community. It could have been brought about by migrants of 'Únětice' identity, who had joined the community, changing and enhancing their social and ritual life. This can be seen in the abandonment of old funerary rites in favour of new ones, according to which deceased prominent community members were buried in graves covered by barrows. Nonetheless, the rites took place in the same place and respected the material values (thus probably religious ones, too) that had been adhered to until then. For reasons unknown to us, but undoubtedly important, the ritual scenario started by the CWC was continued.

Furthermore, the continuity of cultural strategies in the Late CWC and the Early Bronze Age on the Middle Obra River is also seen in the spatial organisation of settlement (Czebreszuk *et al.* 2024). In both Late CWC and Únětice settlement, space was divided into a northern zone (where funerary activities were concentrated) and a southern one (where economic and settlement activities were concentrated).

In the situation outlined above, the important question arises: to what extent was the transition brought about by the tightening of cultural contacts with a new partner — 'Únětice' populations — and to what extent by migration, resulting in newcomers from the (south-) west joining the local community?

Far-reaching analogies may be offered by transformation processes identified in Southeastern Europe. For instance, in the transition between the Middle and Late Helladic periods in Mycenae, at a Middle Bronze cemetery (precisely at the beginning of Middle Helladic III, *c.* 1800 BCE), Shaft Grave Circle B was created (Graziadio 1988; Dietz 1991), having a different design and much richer grave goods than was the case on this site until then (Voutsaki 2021, 26 table 1). A hypothesis was proposed that such changes were a manifestation of long-lasting internal structural transformations within the same community (Voutsaki 1999; 2012; 2021).

Closer still to the Łęki Małe case, Joseph Maran's model suggests that in the transition period between Middle Helladic II and III, the community living in Mycenae was reached by a group of 'rebels' (possibly from Argos), providing an impulse for accelerating socio-political transformations towards a hierarchical society (Maran 2011; 2015).

It must be stressed, however, that in both Łęki Małe and Mycenae a burial place was continuously used by one community that was undergoing deep cultural and identity transformations. They were caused, in addition to the internal dynamics of the local communities under discussion, by their opening to external contacts and, possibly, admission of a group of newcomers with their cultural potential. All that together directed the changes towards a hierarchical society led by the stable elites that ruled Mycenae until *c.* 1200 BCE (*i.e.* 600 years) and Łęki Małe-Bruszczewo (Czebreszuk 2013, 780–782) until 1700 BCE (*i.e.* over 400 years).

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REFERENCES

Bronk Ramsey, C., 2021. *OxCal v4.4.4*. Oxford. https://c14.arch.ox.ac.uk/oxcal

Buchvaldek, M., 1986. *Kultura se šňůrovou keramikou ve střední Evropě. I. Skupiny mezi Harcem a Bílými Karpaty*, Praehistorica 12. Praha: Univerzita Karolova.

Czebreszuk, J., 1996. *Społeczności Kujaw w początkach epoki brązu*. Poznań: Wydawnictwo PSO.

Czebreszuk, J., 2000. Osadnictwo kultury ceramiki sznurowej. *In: Kośko 2000*, 423–454.

Czebreszuk, J., 2013. The Bronze Age in the Polish Lands, *In*: H. Fokkens and A. Harding, eds. *The Oxford Handbook of the European Bronze Age*. Oxford: Oxford University Press, 767–786.

Czebreszuk, J., 2022. At the confluence of the Corded Ware and the Únětice cultures. The case of amber discs. *Studia Hercynia* 26(1), 32–48.

Czebreszuk, J. and Szmyt, M., 2008. Siedlungsformen des 3. Jahrtausends v. Chr. in der polnischen Tiefebene (Kulturen der Trichterbecher, Kugelamphoren und Schnurkeramik). Stand und Perspektiven der Untersuchungen. *In:* W. Dörfler and J. Müller, eds. *Umwelt – Wirtschaft – Siedlungen im dritten vorchristlichen Jahrtausend Mitteleuropas und Südskandinaviens. Internationale Tagung Kiel 4.–6. November 2005*, Offa-Bücher 84. Neumünster: Wachholz, 219–242.

Czebreszuk, J. and Szmyt, M., 2012. Osadnictwo społeczności z późnego neolitu oraz z początków epoki brązu. *In:* J. Czebreszuk, M. Kara, B. Kirschke, U. Narożna-Szamałek, Z. Seroczyński, I. Sobkowiak-Tabaka, M. Szmyt, K. Szamałek and K. Zamelska-Monczak, eds. *Osadnictwo pradziejowe, średniowieczne i nowożytne w Lutolu Mokrym*. Poznań: Instytut Archeologii i Etnologii PAN, 67–111.

Czebreszuk, J., Kośko, A., Makarowicz, P. and Szmyt, M., 2000. Podsumowanie. *In: Kośko 2000*, 569–571.

Czebreszuk, J., Szmyt, M., Müller, J. and Ławniczak, M., 2019. Late Neolithic and Early Bronze Age settlement archaeology on the Oder and Vistula Rivers in north-west Poland. *In:* H. Meller, S. Friederich, M. Küßner, H. Stäuble and R. Risch, eds. *Siedlungsarchäologie des Endneolithikums und der Frühen Bronzezeit. Late Neolithic and Early Bronze Age Settlement Archaeology*. Halle (Salle): Landesamt für Denkmallpflege und Archäologie Sachsen-Anhalt, 807–821.

Czebreszuk, J., Müller, J., Szmyt, M., Goslar, T., Krause-Kyora, B., Jaeger, M., Hildebrandt-Radke, I., Niebieszczański, J., Makowiecki, D., Kneisel, J., Gmińska-Nowak, B., Ważny, T., Rewekant, A. and Raese, H., 2024. Past time defined. Chronology and social meaning of the "princely" barrow cemetery in Łęki Małe and the Central European Early Bronze Age. *PLoS ONE* 19(5), e0300591. https://doi.org/10.1371/journal.pone.0300591

Czebreszuk, J. and Szydłowski, M., 2010. Die Prospektionen im Umfeld von Bruszczewo/Badania powierzchniowe wokół stanowiska w Bruszczewie. *In:* J. Müller, J. Czebreszuk and J. Kneisel, eds. *Bruszczewo. Ausgrabungen und Forschungen in einer prähistorischen Siedlungskammer Grosspolens/Badania mikroregionu osadniczego z terenu Wielkopolski II*, Studien zur Archäologie in Ostmitteleuropa 6. Bonn: Habelt, 82–89.

Dietz, S., 1991. *The Argolid at the Transition to the Mycenaean Age. Studies in the Chronology and Cultural Development in the Shaft Grave Period*. Copenhagen: National Museum of Denmark, Department of Near Eastern and Classical Antiquities.

Graziadio, G., 1988. The Chronology of the Graves of Circle B at Mycenae: A New Hypothesis. *American Journal of Archaeology* 92(3), 343–372.

Kośko, A., ed., 2000. *Osadnictwo kultur późnoneolitycznych oraz interstadium epok neolitu i brązu: 3900–1400/1300 przed Chr.*, Archeologiczne badania ratownicze wzdłuż trasy gazociągu tranzytowego 3.4. Poznań: Wydawnictwo Poznańskie.

Kowiańska-Piaszykowa, M., 1968. Wyniki badań archeologicznych kurhanu IV kultury unietyckiej w Łękach Małych, pow. Kościan. *Fontes Archaeologici Posnanienses* 19, 6–31.

Kowiańska-Piaszykowa, M., 2008. *Cmentarzysko kurhanowe z wczesnej epoki brązu w Łękach Małych w Wielkopolsce*, Bibliotheca Fontes Archaeologici Posnanienses 12. Poznań: Muzeum Archeologiczne w Poznaniu.

Kurzawa, J., 2001. *Zagadnienie najwcześniejszych faz kultury ceramiki sznurowej na Nizinie Wielkopolsko-Kujawskiej*. Poznań: Instytut Historii UAM.

Lipińska, A., 1962. Grób kultury ceramiki sznurowej z Łęk Małych pow. Kościan. *Fontes Archaeologici Posnanienses* 13(1963), 311–313.

Ławniczak, M., in press. *Osadnictwo społeczności neolitycznych i wczesnobrązowych w Polsce północno-zachodniej w świetle analizy dużych zbiorów danych przestrzennych*. Poznań: Muzeum Archeologiczne w Poznaniu.

Maran, J., 2011. Lost in translation: The emergence of Mycenaean culture as a phenomenon of glocalization. *In:* J. Bennet, S. Sherratt and T. Wilkinson, eds. *Interweaving worlds: Systemic interactions in Eurasia, 7th to 1st millennia BC*, Scienze dell'antichita 15. Oxford: Oxbow Books, 282–294.

Maran, J., 2015. Tiryns and the Argolid in Mycenaean Times: New Clues and Interpretations. *In:* A.-L. Schallin and I. Tournavitou, eds. *Mycenaeans up to Date: The Archaeology of the North-Eastern Peloponnese – Current Concepts and New Directions*. Acta Instituti Atheniensis Regni Sueciae, Series 4. Stockholm: The Editorial Committee of the Swedish Institutes at Athens and Rome, 277–293.

Pospieszny, Ł., 2009. *Zwyczaje pogrzebowe społeczności kultury ceramiki sznurowej w Wielkopolsce i na Kujawach*, Studia i Materiały do dziejów Kujaw-Niżu Polski 10. Poznań: Wydawnictwo Poznańskie.

Mittnik, A., Massy, K., Knipper, C., Wittenborn, F., Friedrich, R., Pfrengle, S., Burri, M., Carlichi-Witjes, N., Deeg, H., Furtwängler, A., Harbeck, M., von Heyking, K., Kociumaka, C., Kucukkalipci, I., Lindauer, S., Metz, S., Staskiewicz, A., Thiel, A., Wahl, J., Haak, W., Pernicka, E., Schiffels, S., Stockhammer, P.W. and Krause, J., 2019 Kinship-based social inequality in Bronze Age Europe. *Science* 366, 731–734.

Szmyt, M. and Czebreszuk, J., 2022. Before Barrows. Funnel Beaker culture settlement preceding the Early Bronze Age cemetery in Łęki Małe (site Wilanowo 12). *In:* M. Dębiec, J. Górski, J. Müller, M. Nowak, A. Pelisiak, T. Saile and P. Włodarczak, eds. *From Farmers to Heroes. Archaeological Studies in Honor of Sławomir Kadrow*, Universitätsforschungen zur prähistorischen Archäologie 376. Bonn: Habelt, 337–346.

Szydłowski, M., 2013. *Przemiany osadnicze w dorzeczu górnej Obry w neolicie i początkach epoki brązu*. Wrocław: Chronicon.

Voutsaki, S., 1999. Mortuary display, prestige and identity in the Shaft Grave era. *In:* Römisch-Germanisches Zentralmuseum Mainz, ed. *Eliten in der Bronzezeit. Ergebnisse zweier Kolloquien in Mainz und Athen,* Römisch-Germanisches Zentralmuseum. Forschungsinstitut für Vor- und Frühgeschichte, Monographien 43/1. Mainz: Römisch-Germanisches Zentralmuseum, 103–117.

Voutsaki, S., 2012. From Value to Meaning, from Things to Persons. The Grave Circles of Mycenae Reconsidered. *In:* G. Urton and J. Papadopoulos, eds. *The Construction of Value in the Ancient World*. Kotsen Institute Monographs. Los Angeles: UCLA, 112–37.

Voutsaki, S., 2021. Social Change and Human Agency. The Argolid at the Onset of the Mycenaean Era. *In:* B. Eder and M. Zavadil, eds. *(Social) Place and Space in Early Mycenaean Greece: International Discussions in Mycenaean Archaeology, October 5–8, 2016*. Athens: Austrian Academy of Sciences, 423–452.

Włodarczak, P., 2017. Battle-exes and beakers. The Final Eneolithic societies, *In:* P. Włodarczak, ed. *The Past Societies 2. 5500–2000 BC*. Warszawa: Institute of Archaeology and Ethnology PAS, 275–336.

Frühbronzezeitliche Feinschmiedinnen aus Mikulovice?

Michal Ernée

KEYWORDS: *metallurgy of precious metals, female finesmiths, Early Bronze Age, Únětice Culture, metallurgists' graves, gold and silver working tools, use-wear analyses*

Zusammenfassung

Den Frauengräbern 12 und 13 der frühbronzezeitlichen Nekropole von Mikulovice (Ostböhmen, Tschechische Republik) entstammen Werkzeuge zur Verarbeitung von Edelmetallen sowie versilberter Schmuck aus Kupfer und Bronze. Die Werkzeugkombination ist in beiden Gräbern sehr ähnlich. Die benachbarte Lage der Gräber dürfte ebenso wenig ein Zufall sein wie die nahezu identischen Schmuckbeigaben der beiden Frauen, nämlich die sonst in der Nekropole fehlenden Ringkopfnadeln, Halsketten aus (versilberten) Kupferspiralröllchen und Spiralringe als Ohr-/Haarschmuck, die sich deutlich von anderen Schmuckbeigaben in der Nekropole unterscheiden. Mindestens eine der beiden Frauen trug außerdem einen für diese Zeit einzigartigen versilberten Schmuck.

Aus diesen Gründen interpretieren wir beide Gräber als Bestattungen von Gold- oder Feinschmiedinnen, die längerfristig in der Kleinregion lebten. Aufgrund der direkten Nachbarschaft der beiden Bestattungen in der Nekropole, der identischen Schmuckgarnituren und auch der beiden Werkzeuggarnituren gehen wir von einer engen (sozialen, beruflichen) Beziehung beider Frauen aus. Auf der einen Seite sind sicherlich große metallurgische Werkstätten in der europäischen Frühbronzezeit zu erwarten. Auf der anderen Seite ist es sehr wahrscheinlich, dass auch Einzelpersonen oder sehr kleine Haus- oder Familienbetriebe mit kleinen Mengen hochwertiger Materialien wie Gold oder Silber verarbeitet haben. Unsere beiden Frauen aus Mikulovice dürften zu dieser Art von Goldschmiedinnen gehört haben. Dass sie ausgerechnet an einem wichtigen Knotenpunkt der Bernsteinstraße zu finden sind, ist sicher kein Zufall.

Abstract

The female graves 12 and 13 in the Early Bronze Age (EBA) cemetery in Mikulovice (Eastern Bohemia, Czech Republic) contain tools to process precious metals as well as silver-plated copper/bronze jewellery. The collections of tools in both burials are very similar. The neighbouring location of the two graves close to each other is probably no more a coincidence than the almost identical jewellery sets of both women — namely the ring-headed pins otherwise missing on the necropolis, necklaces made of (silver-plated) copper spiral rolls and spiral rings used as ear/hair ornaments – which clearly differ from other jewellery sets found in the cemetery. At least one of the two women also wore silver-plated jewellery that was unique for this time.

For all these reasons, we interpret these two graves as burials of goldsmiths or finesmiths who lived in the small region for a long time. With regard to the direct proximity of both burials in the necropolis, the identical jewellery sets and also the two tool collections, we assume that they had a close (social, professional) relationship. On the one hand, large metallurgical workshops are certainly to be expected during the European Early Bronze Age. On the other hand, it is also very likely that individuals or very small domestic or family workshops worked with small quantities of high-quality materials such as gold or silver. Our two women from Mikulovice probably belonged to this kind of goldsmith. The fact that they are found at an important junction along the Amber Road is certainly no coincidence.

EINLEITUNG

Metallurgengräber waren schon immer ein reizvolles Thema der Europäischen Spätkupfer- und Frühbronzezeitforschung (zuletzt u. a. Rowlands 1971; Jockenhövel 1982; 1990; Olexa 1987; Mohen 1991; Bátora 2002; 2006, 55–94; Kaiser 2003; 2005; Bertemes 2004; 2010; Martin 2014; 2019). Aus dem dritten und der ersten Hälfte des zweiten Jahrtausends vor Christus kennen wir aus ganz Europa zwischen dem Kaspischen Meer und den Britischen Inseln über 150 Bestattungen (s. u.), bei welchen, meist aufgrund der Beigaben, von einem metallurgischen Hintergrund der beigesetzten Personen ausgegangen werden darf (z. B. Bátora 2006, 55–56; Martin 2019, 227). Bei einigen Bestattungen lässt sich dank der beigegebenen Werkzeuge noch weiter zwischen Metallgießern (Tondüsen, Tiegel, Gussformen) und (Fein)Schmieden (Amboss-/Kissensteine, Hämmer, Steine und Gerölle mit Arbeitsspuren etc.) unterscheiden (z. B. Bátora 2006; Martin 2019, 230–236 Tabelle 2). In Mittel- und Westeuropa sind die meisten Metallurgengräber des ausgehenden Spätneolithikums mit dem Phänomen der sogenannte Glockenbecher (*Bell Beaker Phenomenon*) verbunden. Überraschenderweise werden sie in der nachfolgenden Frühbronzezeit deutlich weniger beobachtet.

Zu den wichtigsten in diesem Zusammenhang diskutierten Fragen gehören immer auch die soziale Stellung und der gesellschaftliche Status der Metallurgen in den endkupferzeitlichen und frühbronzezeitlichen Gesellschaften Eurasiens (u. a. Bertemes 2010, 153–159; Müller 2002; Martin 2019; Peška 2022), beginnend mit den mutmaßlich vorwiegend mobilen bis stetig umherziehenden (aber immer außergewöhnlich ausgestatteten) Metallhandwerkern der Glockenbecherkultur bis hin zu den eher symbolischen einzelnen Werkzeugen — *Pars pro Toto*-Beigaben — in den Fürstengräbern der frühen Bronzezeit, die die Macht und Herrschaft der hier bestatteten Eliten und ihre Kontrolle über der Herstellung und Distribution der Metalle in Form von Rohstoffen, Herstellungsprozessen und auch Fertigwaren symbolisieren sollten. Mit Beginn der Frühbronzezeit wird dann allgemein eine kontinuierliche Abnahme der gesellschaftlichen Wertschätzung der Metallurgen vorausgesetzt — *„Offensichtlich hatte der Handwerker in der klassischen Frühbronzezeit einen im Verhältnis zur Spätkupferzeit niedrigeren gesellschaftlichen Status; zumindest aber gehörte er nicht mehr der Elite an“* (Bertemes 2010, 154).

Genauso wird in der Literatur, Katja Martin (2019, 226, 228) zufolge, durch den vorausgesetzten *„hohen Grad an Wissen“* den frühen Metallurgen *„eine Sonderstellung in den spätkupfer- und frühbronzezeitlichen Gesellschaften zugeschrieben“* (u. a. Bátora 2000; 2002; Bertemes und Heyd 2002; Bertemes 2004; Freudenberg 2006; Kuijpers 2008). Sie kann aber, vor allem aufgrund der Grabausstattungen, keine *„Sonderstellung dieses Handwerks“* bestätigen, *„es können aber keineswegs für alle Befundzusammenhänge — und hier treten v. a. die Bestattungen in den Vordergrund — Hinweise auf eine Sonderstellung dieses Handwerks erbracht werden“* (Martin 2019, 226, 230). Vor allem während der Frühbronzezeit mit ihrer reichen und sophistizierten Bronzemetallurgie und Tausenden von Metallbeigaben in den Gräbern *„nehmen die Nachweise metallurgischer Tätigkeiten in den Gräbern ab, dafür treten sie vermehrt in den herausragenden Bestattungen dieser Zeit auf“* (ebd., 226, 228, 230). In Zusammenhang mit dem sog. *Pars pro Toto*-Prinzip bleibt also unsicher, ob Funde von mit der Metallurgie generell verbundenen Werkzeugen in den Gräbern wirklich bedeuten, *„ob die Bestatteten selbst das metallurgische Handwerk ausübten oder ob nur ihre Macht über die Gewinnung und/oder Verarbeitung des begehrten Rohstoffes im Grab symbolisch dargestellt werden sollte“* (ebd., 226); so dass also Macht und Kontrolle viel mehr zählen als die eigentliche Kunstfertigkeit.

Eine wichtige Rolle spielt dabei unsere Fähigkeit, Metallurgiewerkzeuge bzw. Metallurgengräber überhaupt richtig zu identifizieren, denn *„nicht alle zur Metallbearbeitung genutzten Werkzeuge [werden] sicher erkannt“* (ebd., 226). Bei einigen Artefakten ist nicht (ganz) klar, zu welchen Tätigkeiten sie genau benutzt wurden, oder ob (bzw. gerade weil) sie multifunktional waren (vgl. ebd., 230–236 Tabelle 2). Denn auch *„nicht alle an metallurgischen Prozessen beteiligten Personen [wurden] überhaupt mit entsprechendem Werkzeug beigesetzt“* (ebd., 230); so ist es auch „oft schwer, eine bestimmte Spezialisierung des Bestatteten zu erkennen“ (ebd., 226).

Wie die Autorin erwähnt (ebd., 227 Abb. 1), „[konnten] *im gesamteuropäischen Raum 155 Gräber, 111 Siedlungen, acht Horte und 23 Einzelfunde aufgenommen werden, die chronologisch zwischen dem späten Neolithikum und der entwickelten frühen Bronzezeit eingeordnet werden könnten*“. Was die eigentliche Frühbronzezeit (also die Stufen Bz A1 bis A2c) betrifft, hat sie im mitteleuropäischen Raum insgesamt 33 Gräber mit Nachweisen metallurgischer Tätigkeiten identifiziert (ebd., 227).

Trotz vieler zusammenhängender und mehr oder weniger intensiv diskutierter Fragen ist aber eines ganz klar: *Es war* in diesem Kontext immer **fast ausschließlich von Metallurgen — also Männern — die Rede** (z. B. Müller 2002, 281–282 Abb. 15), **kaum von Frauen**.[1]

In Zusammenhang mit dem *„deutlichen Missverhältnis“* zwischen der hochwertigen frühbronzezeitlichen Metallurgie auf der einen Seite und der geringen Anzahl von Metallurgengräbern auf der anderen Seite thematisiert Katja Martin auch die Überlegung, dass *„das Vorkommen wenig aufwendig ausgestatteter Gräber mit Metallurgiewerkzeugen“* dafür sprechen könnte, *„dass weitaus mehr Bevölkerungsteile mit den Techniken der Metallurgie vertraut waren, als wir heute zu erkennen in der Lage sind“* (Martin 2019, 230).

Dahingehend argumentieren auch die Autoren der 2013 veröffentlichten vorläufigen Publikation über die Bestattung einer 45–60 Jahre alten Frau aus dem Grab 3 der niederösterreichischen Aunjetitzer Nekropole Geitzendorf (Lauermann und Pany-Kucera 2013; Lauermann 2012), die u. a. mit vier *„beabsichtigt deponierten Steinen“*, *„sogenannten ‚Cushion Stones‘ “* ausgestattet war (ebd., 27 Abb. 3). Die Autoren schreiben:

„Der Befund gibt Anlass zur Meinung, dass handwerkliche Techniken im Zusammenhang mit Schmuckherstellung durchaus vor Ort auch von Frauen durchgeführt werden konnten. Bislang war man einhellig der Meinung, dass sogenannte Cushion Stones, die mit der Metallverarbeitung als Werkzeug beim Treiben von Metallblech ausschließlich mit Männergräbern in Verbindung gebracht werden (Müller 2002, 281 Abb. 15).“

(Lauermann und Pany-Kucera 2013, 103)

Dabei müssen wir aber auch zugeben, dass die Organisation des frühbronzezeitlichen Metallhandwerks *„weitgehend noch im Dunkeln“* liegt (ebd., 103), genauso wie die eigentliche Herkunft und soziale Stellung der Metallurgen innerhalb der damaligen Gesellschaften.

DIE GRÄBER 12 UND 13 VON MIKULOVICE

Die Nekropole der frühbronzezeitllichen Aunjetitzer Kultur in Mikulovice (Bez. Pardubice, Ostböhmen) mit 109 Skeletten in 98 Gräbern und drei Siedlungsgruben (Abb. 1 A–C) wurde erschöpfend veröffentlicht und ist deswegen weitgehend gut bekannt (Ernée und Langová *et al.* 2020). Die Außerordentliche Menge an importierten Exotika, darunter mehr als 800 Bernsteinartefakte (25,7 % aller Gräber und 38 % aller Frauengräber), verleiht dem Gräberfeld seinen herausragenden Status als eines der reichsten seiner Zeit in Europa. Da alle Detailinformationen zu den Gräbern, Skeletten, Funden und durchgeführten Analysen in der Gesamtpublikation (Ernée und Langová *et al.* 2020) leicht zugänglich sind, erwähne ich hier nur die für das aktuelle Thema wichtigen grundlegenden Punkte.

Die Gräber 12 und 13 liegen dicht nebeneinander, die Grabgruben sind N-S orientiert, die Skelette in der für die Aunjetitzer Kultur typischen Lage (rechte Hocke mit Kopf nach Süden und Blick gen Osten) niedergelegt (Abb. 1 D, gelb markiert).

Grab 12 (Abb. 2; Abb. 5 A, E) (vgl. Ernée und Langová *et al.* 2020, 57, 576 Tabelle 6)
Skelett: ***Geschlecht***: weiblich. ***Altersgruppe***: *senilis*. ***Sterbealter in Jahren***: 55 +
Funde (Abb. 2): zwei Gefäße, klassische Aunjetitzer Tassen (1, 2), die erste Aunjetitzer Tasse (1) vor dem Brustkorb, die zweite (2) unter den Füßen, in der SW-Ecke der Grabgrube; bronzene Ringkopfnadel (3) vor dem Kinn; drei bronzene Spiralringe (4, 6–7) und ein Noppenring (5), davon zwei Spiralringe (4, 7) auf der linken, der Spiralring 6 und der Noppenring 5 dann auf der rechten Kopfseite; Halskette von wenigstens 5 bronzenen Spiralröllchen (8/1–7) im Halsbereich unter dem Unterkiefer (4 komplett erhalten und mehrere Bruchstücke von wenigstens zwei weiteren); 1 Bruchstück von Bergkristall (9) bei der Nadel Nr. 3; Kieselstein/Steingerät (10) über den Knien, bei der linken Handfläche; zwei Knochenpfrieme (11, 12), der eine (11) unter der Tasse Nr. 1, der zweite, größere (12) bei den Knien; Tierknochen, Schulterblatt eines Schafs/einer Ziege (13) bei der Tasse Nr. 2 als Speisebeigaben.

1 Zu den seltenen, die Regel bestätigenden Ausnahmen gehört das Grab einer jungen Frau (18–20 Jahre) der Katakomben-Kultur aus Aksaj in Südrussland, bei Rostow am Don (Vlaskin 1999, 65; Bátora 2006, 67). Das von Fancois Bertemes (2010, 153, ohne Literatur) erwähnte einzige glockenbecherzeitliche Frauengrab aus der Mährischen Fundstelle Tvořihráz (fälschlich als Tvožihráz bezeichnet) lässt sich so nicht bestätigen. J. Peška rechnet in seiner letzten Studie (Peška 2022) dieses Frauengrab deshalb nicht zu den Metallurgenbestattungen, weil die beiden aus Gletscherspaltgestein hergestellten und ziemlich kleinen Steingeräte nicht den Geräten entsprechen, die in der Glockenbecherzeit üblicherweise zu den metallurgischen Werkzeugen gerechnet werden (mündl. Mitt. J. Peška).

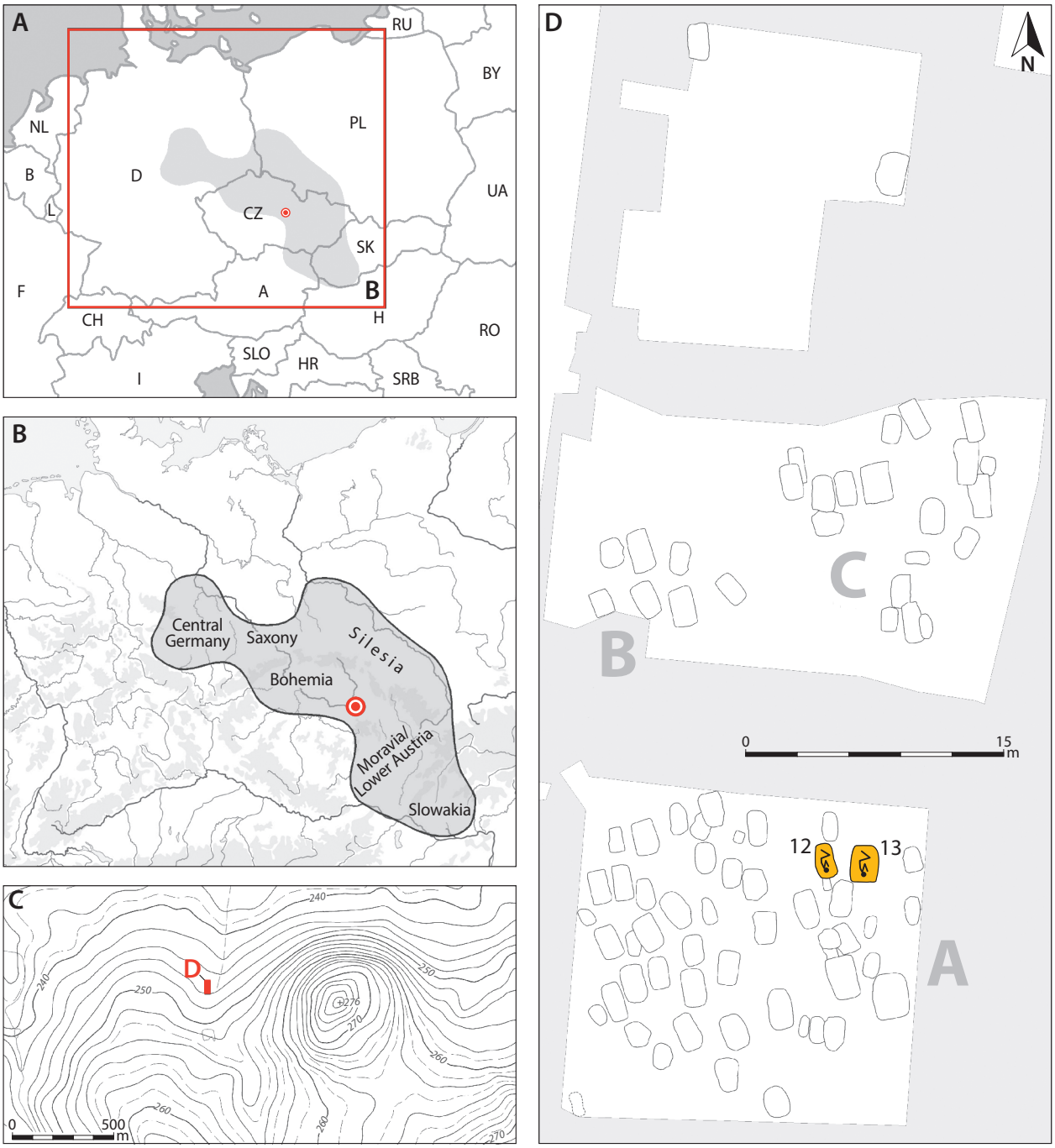

Abb. 1. Mikulovice, Ostböhmen, Tschechische Republik. ***Rot*** *Fundstelle auf der Karte (Mittel-)Europas (**A**, **B**);* ***grau*** *Gebiete und Regionalgruppen der Aunjetitzer Kultur (**A**, **B**);* ***gelb*** *Lage der Gräber 12 und 13 in der Gräbergruppe A (**D**).*

1 Klassische Aunjetitzer Tasse mit tiefem Umbruch. Typ A1.2 nach Martin Bartelheim (1998) bzw. 1A2 nach B. Zich (1996) (Abb. 2.1);
2 Klassische Aunjetitzer Tasse mit tiefem Umbruch. Typ A1.2 nach Martin Bartelheim (1998) bzw. 1A2 nach B. Zich (1996) (Abb. 2.2);
3 Ringkopfnadel, Bronze (Abb. 2.3);
4 Spiralring, Bronze, li. Kopfseite (**Typ A2P-2** nach Ernée und Langová *et al.* 2020 Abb. 85) (Abb. 2.4);
5 Noppenring, Bronze, re. Kopfseite (**Typ B2P1** nach Ernée und Langová *et al.* 2020 Abb. 85) (Abb. 2.5);
6 Spiralring, Bronze, rechte Kopfseite (**Typ A2P-2** nach Ernée und Langová *et al.* 2020 Abb. 85) (Abb. 2.6);

7 Spiralring, Bronze, linke Kopfseite (**Typ A2P-2** nach Ernée und Langová *et al.* 2020 Abb. 85) (Abb. 2.7);
8/1–7 Spiralröllchen, Bronze (Abb. 2.8/1–7);
9 Spaltindustrie, Bergkristall (Abb. 2.9);
10 Steingerät, Kieselstein – s. u. (Abb. 2.10);
11 Knochenpfriem (Schaf/Ziege, *metapodium, dist.*), unter dem Gefäß Nr. 1 (Abb. 2.11);
12 Knochenpfriem, L 158 mm (großes Säugetier, *metapodium, prox.*), über den Knien (Abb. 2.12);
13 Tierknochen (Schulterblatt von Schaf/Ziege) beim Gefäß Nr. 2.

Grab 13 (Abb. 3; Abb. 5 B–D, F) (vgl. Ernée und Langová *et al.* 2020, 57–58, 577 Tabelle 7)
Skelett: ***Geschlecht***: heranwachsend, weiblich. ***Altersgruppe***: *juvenis*. ***Sterbealter in Jahren***: 18–20.
Funde (Abb. 3): drei Gefäße (1a, 1b, 2), davon zwei Schüssel (1a, 1b) ineinander gelegt, vor dem Brustkorb, neben dem Miniaturgefäß Nr. 2 an der rechten Schulter; bronzene Ringkopfnadel (3) an der rechten Schulter, zwischen der Schulter und dem Miniaturgefäß Nr. 2; Bronzestäbchen mit knöchernem Griff (4) nördlich des Miniaturgefäßes Nr. 2; wenigstens vier bronzene Spiralringe (5a–5d, 6), davon zwei auf der rechten (5c, 5d) und zwei auf der linken (5a, 5b) Kopfseite und Teile eines weiteren (6?) im Halsbereich; Halskette von mehreren bronzenen Spiralröllchen (7/1–8, 7a, 7b) unter dem Unterkiefer, im Halsbereich; Kieselstein/Steingerät (8) beim Miniaturgefäß Nr. 2; Tierknochen (Schulterblatt und Rippen eines Schweins) bei Knien (10, 11) als Speisebeigaben. Artefakte Nr. 2, 4, 8 und 9 bilden gemeinsam einen Komplex bzw. eine Garnitur.
1a Schüssel mit kurzem abgesetztem gekehltem Hals, stark einziehendem Unterteil, kleinem Standboden und kleinem Henkel unter dem Rand. Dem Typ L1.5 nach Martin Bartelheim (1998) nahestehend, Typ 4K1 nach Bernd Zich (1996) (Abb. 3.1a);
1b Flache bis tellerförmige stark konische Schüssel bzw. Teller. Dem Typ L4.2 nach Martin Bartelheim (1998) nahestehend, aber viel flacher, dem Typ 5A2 nach Bernd Zich (1996) nahestehend, Lage in der Schüssel Nr. 1a (Abb. 3.1b);
2 Miniaturgefäß, Steilhalsgefäß mit konischem abgesetztem Hals und tiefgelegenem Bauch mit zwei gegenüberstehenden Warzen am Umbruch. Typ H2.1 nach Martin Bartelheim (1998) und 11A2 nach Bernd Zich (1996) (Abb. 3.2);
3 Ringkopfnadel, Bronze (Abb. 3.3);
4 Stäbchen aus Bronze im Griff aus Tierknochen (Wildkatze) (Abb. 3.4);
5a Spiralring, Bronze, linke Kopfseite (**Typ A2L-3+** nach Ernée und Langová *et al.* 2020 Abb. 85) (Abb. 3.5a);
5b Spiralring, Bronze, linke Kopfseite (**Typ A2.-3+** nach Ernée und Langová *et al.* 2020 Abb. 85) (Abb. 3.5b);
5c Spiralring, Bronze, rechte Kopfseite (**Typ A2P-2+** nach Ernée und Langová *et al.* 2020 Abb. 85) (Abb. 3.5c);
5d Spiralring, Bronze, rechte Kopfseite (**Typ A2.-2+** nach Ernée und Langová *et al.* 2020 Abb. 85) (Abb. 3.5d);
6 Spiralring (Teil), Bronze, beim Hals (**Typ A2P-1+** nach Ernée und Langová *et al.* 2020 Abb. 85) (Abb. 3.6);
7 Spiralröllchen, Bronze, vorwiegend unter dem Unterkiefer und im Halsbereich (Abb. 3.7/1–8);
8 Steingerät, Kieselstein – siehe unten (Abb. 3.8);
9 Knochenpfriem, L 81,1 mm (Schaf/Ziege, metapodium, dist.), auf einer Fläche Arbeitsspuren identifiziert (Abb. 3.9);
10 Tierknochen (Schulterblatt vom Schwein) über den Knien (Abb. 3.10);
11 Tierknochen (Rippen vom Schwein) über den Knien (Abb. 3.11).

STEINGERÄTE AUS DEN GRÄBERN 12 UND 13 VON MIKULOVICE

In beiden Gräbern wurden unter anderem auch Steingeräte in Form von kleinen Kieselsteinen aus Quarz gefunden, auf deren (Arbeits-)Flächen eindeutige Arbeitsspuren und Überresten von Edel- und Buntmetallen (vor allem Gold, weniger sodann Silber, Kupfer oder Zinn) identifiziert wurden. Die einzelnen Seiten der Geräte sind durchnummeriert, die Seiten mit eindeutig identifizierten Nutzungs-/Arbeitsspuren grau hervorgehoben (Abb. 4). Die Oberflächen der Steine wurden vor der rasterelektronenmikroskopischen SEM/EDS-Analyse nur leicht in stehendem Wasser mit den Fingern, ohne jede Bürste gereinigt.

12/10 – (Abb. 2.10; Abb. 4 oben; Tabelle 1)
Form: Flacher, länglicher bis mäßig trapezförmiger Kieselstein mit flachen Seiten und abgerundeten Kanten.
Maße: 42,8 x 27,3/20 x 15 mm.
Gewicht: 30,6 g.
Material: Quarz, örtlich.
Nutzungs-/Arbeitsspuren wurden mikroskopisch auf den Seiten 3, 5 und 6 identifiziert, die wir deswegen für Arbeitsflächen halten (Abb. 4 oben re.). Es geht um schmale (*ca.* 0,2 mm breite), parallel dicht aneinander angeordnete Ritzlinien mit abgerundeten Kanten, die senkrecht oder nur mäßig schief zu der Längsachse des

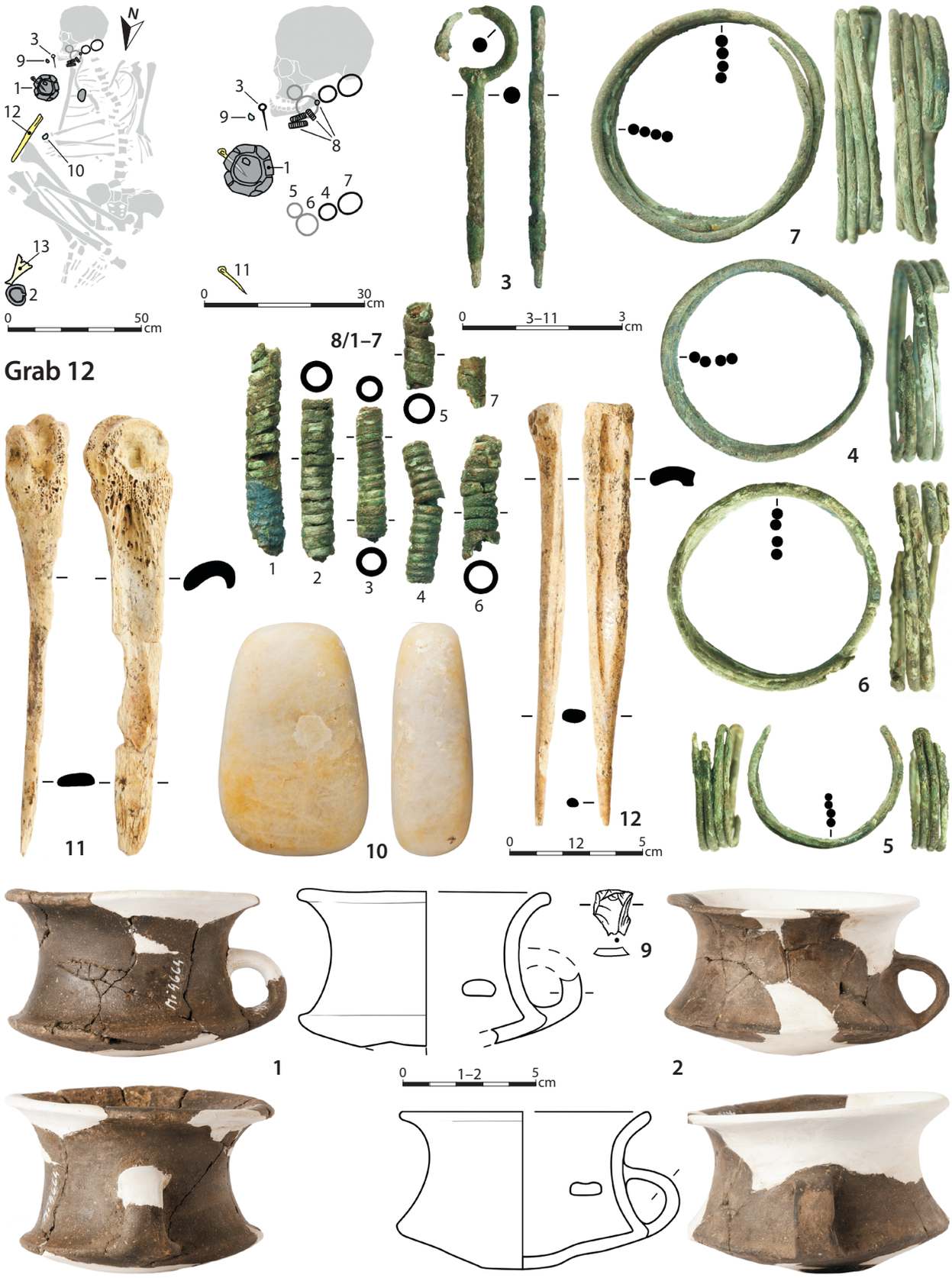

*Abb. 2. Mikulovice, Grab 12. Die Grabbeigaben und ihre Lage zum Skelett: **1–2** Keramik; **3–8** Bronze (teilweise versilbert); **9** Bergkristall; **10** Steingerät; **11–12** Werkzeuge aus Tierknochen; **13** Tierknochen (Schulterblatt). (Fotos: Michaela Langová, Zuzana Kačerová; Zeichnungen: Michaela Langová, Michal Ernée).*

Abb. 3. Mikulovice, Grab 13. Die Grabbeigaben und ihre Lage zum Skelett: ***1a, 1b,*** *2 Keramik,* ***3–4, 5a, 5b, 5c, 5d, 6–7*** *Bronze (teilweise versilbert),* ***8*** *Steingerät,* ***9*** *Werkzeug aus Tierknochen,* ***10–11*** *Tierknochen (Schulterblatt und Rippen). (Foto: Michaela Langová, Zuzana Kačerová, Zeichnungen: Michaela Langová, Michal Ernée).*

Tabelle 1. Mikulovice, Metallspuren auf den Steingeräten 12/10 und 13/8; — Metallspuren nicht identifiziert; • Metallspuren in Spurenmengen identifiziert (Einzelflitter, ca. 1–2 auf der Fläche); **x** *Metallspuren in kleineren Mengen präsent (ca. 5–10 Flitter auf der Fläche);* **X** *Metallspuren identifiziert in größerer Anzahl (wenige Dutzende von Metallflittern);* **XXX** *Metallspuren identifiziert in extrem hoher Menge (mehrere Dutzende bis potenziell mehrere Hunderte von Metallflittern auf der Fläche).*

Gerät	Maße (mm)			Gewicht (g)	Rohstoff	Flächen mit Metallspuren						Metallspuren (Menge)												
																			Mischungen				
	Länge	Breite	Höhe			1	2	3	4	5	6	Au	Ag	Cu	Sn	Fe	Pb	Zn	Cu/Sn	Sn/Zn	Cu/Zn/Ni	Cu/Sn/Zn	Cu/Zn
12/10	42,8	27,3/20,0	15,0	30,6	Quarz	–	–	X	–	X	X	x	x	x	x	•	x	x	•	•	•	•	–
13/8	33,8	22/15	15,2	16,1	Quarz	–	–	X	–	–	–	XXX	•	–	•	–			–				•

Gerätes verlaufen (Abb. 4 A). Die Ritzlinien lassen sich von der Steinoberfläche farblich nicht unterscheiden. Die Arbeitsflächen sind ziemlich klein, in etwa länglich, *ca.* 24 x 10 mm (3) und 38 x 8/10 mm (5, 6) groß, mit mäßig abgerundeter Oberfläche. Identische Spuren auf allen Arbeitsflächen deuten darauf hin, dass alle Seiten der Geräte zu gleichen oder ähnlichen Tätigkeiten benutzt wurden — sie entstanden bei einer schnellen, intensiven Wechselbewegung hin und zurück, die mit hoher Intensität ausgeführt wurde, vielleicht im Kontakt mit feinkörnigem Material, das aber keine scharfkantige Spuren auf der Oberfläche hinterließ.
Metallspuren: Mit Hilfe der Rasterelektronenmikroskopie (SEM/EDS; zur Methodik siehe Ernée und Langová *et al.* 2020, Kap. 11.8.2) wurden auf den Arbeitsflächen 3, 5 und 6 kleine Flitter von vorwiegend Gold (Abb. 4 C), vereinzelt Silber, Blei, Zinn, Zink und Kupfer, ganz selten dann auch Mischungen von Cu/Sn, Sn/Zn, Cu/Zn/Ni und Cu/Zn/Sn identifiziert.

13/8 – (Abb. 3.8; Abb. 4 unten; Tabelle 1)
Form: Länglicher, unregelmäßig trapezförmiger Kieselstein mit stark abgerundeten Seiten
Maße: 33,8 x 22/15 x 15,2 mm
Gewicht: 16,1 g.
Material: Quarz, örtlich
Nutzungs-/Arbeitsspuren waren nur auf der einzigen identifizierten Arbeitsfläche 3 mikroskopisch feststellbar (Abb. 4 unten Mitte). Alle anderen Seiten waren natürlich glatt, ohne relevante Nutzungsspuren. Die Arbeitsfläche 3 ist etwa oval, 15 x 8/10 mm groß. Form und Anordnung der Spuren sind mit denen auf dem Gerät 12/10 fast identisch (parallel angeordnete haarfeine Ritzlinien mit runden Kanten), wenn auch nicht so deutlich zu erkennen (Abb. 4 B). Womöglich wurde dieses Gerät nicht so lange oder intensiv genutzt. Angesichts der identischen Arbeitsspuren könnte das Gerät aus Grab 13 zu denselben Tätigkeiten wie das Gerät aus Grab 12 benutzt worden sein.
Metallspuren: Es wurden auf der Arbeitsfläche 3 und auch auf der kleineren gegenüberliegenden Seite 4 (ohne Abnutzungsspuren) Spuren von überwiegend Gold (Abb. 4 D–F), vereinzelt auch Silber, Zinn und Kupfer mit Zinkanteil in Form von kleinen Flittern identifiziert.

Die beiden Steingeräte 12/10 und 13/8 nutzen die natürliche Form der Quarz-Kieselsteine aus. Das Material war in der unmittelbaren Nachbarschaft der Fundstelle ohne Weiteres auffindbar. Die beiden Steinartefakte dienten zweifellos

a) als Geräte, was die Nutzungs-/Arbeitsspuren auf einigen Flächen belegen,
b) zum Bearbeiten von Edel- bzw. Buntmetallen, v. a. aber von Gold, was wieder eindeutig die Metallspuren auf einigen der (Arbeits-)Flächen belegen.

Die Metallspuren wurden in Form von winzigen Metallflittern mit einer Größe von 2–10 (bis 15) Mikrometer (µm; 1 µm = 0,001 mm; 1 mm = 1000 µm) dokumentiert (Abb. 4 C–F). Diese Metallflitter wurden auf den (Arbeits-)Flächen in unterschiedlichen Mengen festgestellt, die wir in vier Stufen beschreiben (Tabelle 1). Die analysierten Metallflitter waren entweder reine Metalle (Au, Ag, Cu, Sn, Fe, Pb, Zn) oder es handelte sich um Mischungen, zumeist von Kupfer (Cu) mit weiteren Elementen (Sn, Zn, Zn/Ni, Sn/Zn, Au/Ag). Überwiegend wurden reine Metalle festgestellt, Metallmischungen hingegen nur im Ausnahmefall. Die komplette Bandbreite aller sieben identifizierten Metalle war nur auf Gerät 12/10 zu finden. Auf Gerät 13/8 wurde Gold in einer größeren Menge identifiziert. In einigen Fällen darf man bei Kieselsteinen davon ausgehen, dass die mikroskopischen Metallflitter, vor allem die von Gold, schon in den goldtragenden Bächen und Flüssen auf die Oberfläche kamen, dann aber auf allen Seiten etwa gleichmäßig verstreut. Eindeutig anders ist das aber bei Geräten, wo die Metallflitter erst in den

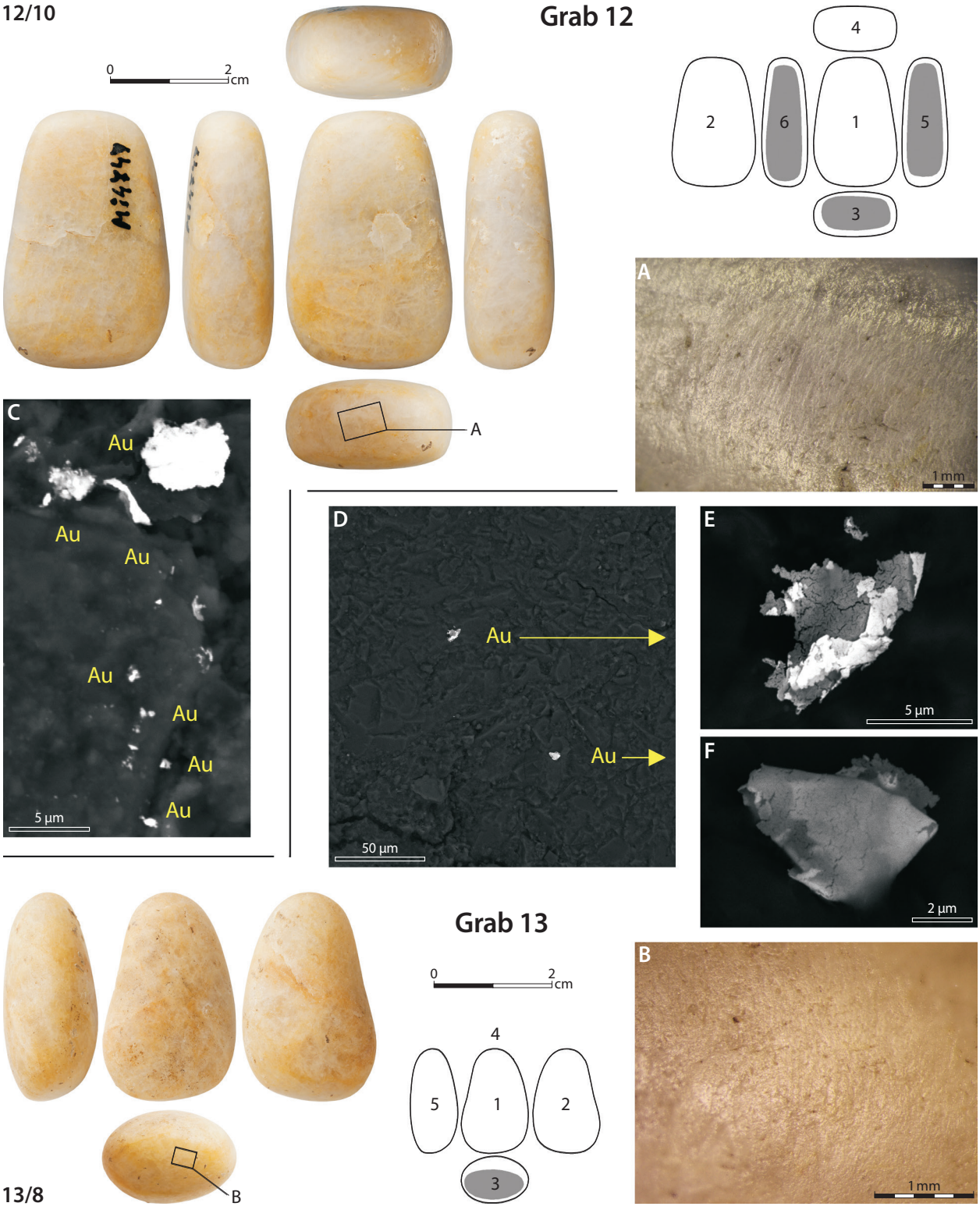

*Abb. 4. Mikulovice. Steingeräte aus den Gräbern 12 und 13. Fotos der Steingeräte und Schemata der Arbeitsflächen (**grau**) mit festgestellten Arbeitsspuren (**A**, **B**). Beispiele von Metallflittern, dokumentiert mit Hilfe der Rasterelektronenmikroskopie auf den Arbeitsflächen beider Steingeräte (Foto: Šárka Křížová, Kamila Moravcová, Zeichnungen: Michal Ernée).*

Arbeitsspuren zu identifizieren waren, also erst nach oder während deren Entstehung in großen Mengen auf die Steinoberflächen gekommen sein mussten. Dies ist auch für die beiden Geräte aus den Gräbern 12 (12/10)

und 13 (13/8) der Fall. Deswegen interpretieren wir die beiden Steinartefakte als Geräte, die fortlaufend in Kontakt mit Gold bzw. Goldartefakten kamen — z. B. Gold-/Feinschmiede-Werkzeuge. Auch allgemein macht gerade das Schmiedewerkzeug in den Gräbern den größten Anteil der mit dem Guss- und Schmiedehandwerk in Zusammenhang gebrachten Geräte aus (Martin 2019, 230).

WERKZEUGSÄTZE (VGL. ERNÉE UND LANGOVÁ *ET AL.* 2020, 437–440, 467–468 ABB. 294–295 TABELLE 76)

In beiden Gräbern wurden die Steingeräte in unmittelbarer Nachbarschaft zu anderen Artefakten dokumentiert — im Grab 13 nahe einem Miniaturgefäß, einem Knochengerät/Knochenpfriem und einem Bronzegerät mit knöchernem Griff, im Grab 12 neben einem Knochengerät. Es geht hier nicht um zufällige Gruppierungen von Artefakten, sondern um Kollektionen, die wir als funktionelle Sets, also Werkzeugsätze bezeichnen können.

Grab 12

(Abb. 2; Abb. 5 A, E). Vor dem Brustkorb der beigesetzten Frau eine Aunjetitzer Tasse (1), unter der Tasse ein 8 cm langer Knochenpfriem (11), in der Nähe ein kleines Stück Bergkristall (9), bei den Knien ein weiterer, 15,6 cm langer Knochenpfriem (12) und *ca.* 4 cm in der Brustkorb-Richtung ein Kieselstein (10). Die möglichen Speisebeigaben (Schulterblatt von Schaf/Ziege und eine weitere Aunjetitzer Tasse) wurden unter den Füßen der beigesetzten Frau deponiert. Aus der Lage der Werkzeuge alleine ist nicht eindeutig klar, genau welche von ihnen ursprünglich eine funktionelle Kollektion bilden sollten. Es ist nicht auszuschließen, dass ursprünglich nur einige der festgestellten Gegenstände ein funktionelles Set bildeten.

Grab 13

(Abb. 3; Abb. 5 B–D, F). Neben der rechten Schulter der beigesetzten jungen Frau (18–20 Jahre) wurden mehrere Artefakte dokumentiert. Im Kontakt mit dem Miniaturgefäß (2) befanden sich ein Kieselstein (8) und ein Knochenpfriem (9), wenige Zentimeter weiter ein Bronzegerät — Bronzestäbchen im Knochengriff (4). *Ca.* 8–10 cm von dieser Gruppierung entfernt lagen dann zwei ineinander gelegte Schüsseln (1a, 1b). Angesichts des Umstands, dass die vermutlichen Speisebeigaben (Schulterblatt und Rippen eines Schweins) anderswo lagen, konnten die beiden Schüsseln durchaus auch eine andere Funktion als die eines potenziellen Behälters für Speisebeigaben gehabt haben.

Im Sinne der von François Bertemes definierten Kategorien der aus Gräbern stammenden Artefakte — *Beigaben*, *Mitgaben*, *Trachtbestandteile* und *Nachgaben* (Bertemes 1989, 42; vgl. Ernée 2015, 160–167 Tabelle 14; Ernée und Langová *et al.* 2020, 432–454 Abb. 294–305 Tabelle 75–78) — rechnen wir die Kollektionen der Geräte aus den Gräbern 12 und 13 aus Mikulovice eindeutig zu den **Mitgaben**, also Artefakten, die dem Beigesetzten ins Grab deshalb mitgegeben wurden, weil *„sie in seinem Leben eine wichtige Rolle gespielt haben“*, seinen Besitzer *„von anderen Menschen abgehoben haben“*. Wichtig ist, dass diese Gegenstände *„von ihrer Lage in der Grabgrube her nicht zur Tracht gehören“*, sondern „zusätzlich mit ins Grab gegeben worden sind“ (vgl. Bertemes 1989, 50–52). Bei der Interpretation solcher Artefakte oder Artefakt-Gruppen ist die genaue Lage im Grab oder zum Skelett oder seinen Teilen entscheidend und deswegen auch die genaue detaillierte Dokumentation der Position aller Gegenstände (im Grab, zum Skelett und zueinander) sehr wichtig. Die Interpretation ist bei denjenigen Gegenständen einfacher, deren Funktion wir kennen oder wenigstens voraussetzen können, wie z. B. Dolche oder Äxte/Beile.

Einzelne Gegenstände, aber auch Kollektionen von Geräten sind schwerer eindeutig zu interpretieren. Werkzeuge und andere Artefakte wurden oft isoliert in Gräbern niedergelegt, in einigen Fällen liegen aber auch enge räumliche Beziehungen zwischen einigen Artefakten vor. Sehr oft geht es um einen einzigen Gegenstand im Zusammenhang mit einem Miniaturgefäß — unmittelbar neben oder sogar in dem Gefäß niedergelegt (meist in Frauengräbern festgestellt). In einigen Fällen handelt es sich aber um Gruppen von mehreren, eindeutig absichtlich zusammen niedergelegter Werkzeuge, die ursprünglich höchstwahrscheinlich eine funktionelle Einheit, eine Kollektion bildeten. Evident ist die enge Verbindung zu den Miniaturgefäßen z. B. in den Fällen, in denen in einem ganz anderen Teil der Grabgrube noch ein weiteres Gefäß zu finden ist, oft zusammen mit Tierknochen (Schulterblatt, Rippen), also den möglichen Speisebeigaben, oder die Tierknochen allein in einem anderen Teil der Grabgrube deponiert wurden. In diesem Fall erfüllt das Miniaturgefäß nicht die Funktion der Speisebeigabe sondern hat einen anderen Zweck.

Das gemeinsame Vorkommen von Artefakten in einem Grab muss für sich genommen noch nicht unbedingt deren funktionellen Zusammenhang in der lebendigen Kultur belegen. Einige Beobachtungen deuten aber in diese Richtung. Ich denke hier vor allem an das wiederkehrende, nicht zufällige Vorkommen derselben Artefakte wie kleine Steinartefakte/Kieselsteine zusammen mit Knochengeräten (vgl. Martin 2019,

*Abb. 5. Mikulovice. Grab 12 (**A**, **E**), Grab 13 (**B–D**, **F**), Werkzeugset im Grab 13 (**C**), Schmuckgarnituren in den Gräbern 12 und 13 (**E**, **F**), Versilberungsspuren auf den Spiralröllchen 13-7/1 (**G–H**) und 13-7/4 (**K**). (Foto: Jarmila Švédová, Šárka Křížová, Zuzana Kačerová, Zeichnungen: Michal Ernée, Michaela Langová).*

230–234 Tabelle 2) und Miniaturgefäßen in einigen Frauengräbern fast auf jeder Nekropole der klassischen Aunjetitzer Kultur oder die eindeutige Identifikation kleiner Stein-(Knochen-)Artefakte als Werkzeuge anhand ihrer Arbeitsspuren. Dies betrifft auch die beiden Steingeräte aus den Gräbern 12 und 13 von Mikulovice.

Kollektionen von Geräten, die mit der Metallurgie in Zusammenhang stehen und in Gräbern immer wieder in ähnlichen Kombinationen auftreten, sind schon seit den Vorgängerkulturen der späten Kupferzeit bekannt, insbesondere der Glockenbecher (*Bell Beaker phenomenon*; vgl. Moucha 1989; Bertemes *et al.* 2000;

Müller 1987; Bertemes 2010; Fitzpatrick 2011; Nessel 2012; Armbruster und Comendador Rey 2015; Rašková Zelinková 2009; Peška 2022), seltener jedoch aus der anschließenden Frühbronzezeit (vgl. Hundt 1975). Dies gilt auch für das Umfeld der Aunjetitzer Kultur, einschließlich der ansonsten metallurgisch hochentwickelten klassischen Phase (*ca.* 2000–1750 v. Chr.), auch wenn wir solche Werkzeugsätze aus verschiedenen benachbarten Gebieten oder kulturellen Milieus kennen (vgl. Bertemes 2010, 148–153; Bátora 2002; 2005; 2006, 55–94; Olexa 1987). Zu den Ausnahmen ist vielleicht das Grab 16 aus der Nekropole in Prag-Miškovice rechnen, aus dem zwei Steinwerkzeuge mit Edelmetallspuren stammen (Ernée 2015). Der Grund dafür mag aus heutiger Sicht darin liegen, dass einige aus den Gräbern der Aunjetitzer Kultur schon seit dem 19. Jahrhundert ansonsten häufig nachgewiesenen Funde, wie z. B. die kleinen Steine/Steingeräte, lange Zeit nicht detailliert analysiert wurden und unbeachtet blieben (Moucha 1989, 215–216).

Heute wissen wir, dass gerade auf den Oberflächen solcher Steine oft Arbeitsspuren erhalten geblieben sind, in denen sich auch Spuren der verarbeiteten Metalle nachweisen lassen (vgl. Armbruster 2006; Adams *et al.* 2009; Martin 2014). Der detaillierten Analyse solcher kleinen frühbronzezeitlichen Steingeräte und deren Zusammenhang mit metallurgischen Tätigkeiten wurde aber erst in den letzten Jahren vermehrt Aufmerksamkeit geschenkt. Neben Mitteleuropa (vgl. Freudenberg 2009; Lauermann 2012; Lauermann und Pany-Kucera 2013; Martin 2014; Ernée 2015, 129–140, 284–285; Ernée und Langová *et al.* 2020) vor allem im Umfeld der El Argar-Kultur (vgl. Risch 2002; Delgado-Raack und Risch 2006; 2008; Delgado-Raack *et al.* 2014; 2016), auf den Britischen Inseln (Boutoille 2019) oder auch auf allgemeiner theoretischer Ebene (vgl. Dubreuil und Savage 2014; Dubreuil *et al.* 2015).

WER WAREN DIE FRAUEN AUS DEN GRÄBERN 12 UND 13 IN MIKULOVICE?

Wie bereits erwähnt, sind die beiden Sätze solcher Geräte aus den beiden Frauengräbern 12 und 13 von Mikulovice in diesem Fall nicht die ersten bekannten Vorläufer einer inklusiveren Lesart metallurgischer Fertigkeiten — sondern die weibliche aunjetitzer Bestattung von Geitzendorf (siehe oben; Lauermann 2012; Lauermann und Pany-Kucera 2013). Bei der Interpretation der Nutzung der in diesem Grab von Geitzendorf gefundenen Steinwerkzeuge tendieren die Autoren eher zu deren Verwendung zur *„Schmuckherstellung"* als zu *„Guss- bzw. Schmiedearbeiten"*; Lauermann und Pany-Kucera 2013, 103); die bestattete Frau deuten sie vorläufig als *„female goldsmith"*, also Goldschmiedin (ebd.,102; vgl. auch Mihok *et al.* 1996).

Aber wer waren die zwei Frauen aus Mikulovice? Was können wir eigentlich zu den gegenseitigen Beziehungen oder der Stellung dieser Frauen innerhalb ihrer Gemeinschaft sagen?

Anhand der reichen und typischen Beigaben (klassische Tassen, Bronzeschmuck) und den zwei ^{14}C-Daten — Grab 12, MAMS-30462, 3489 ± 25 BP, **1888–1742 cal BC** (2-sigma, IntCal20) und Grab 13, MAMS-30471, 3527 ± 9 BP, **1931–1770 cal BC** (2-sigma, IntCal20) — datieren die beiden Gräber in die klassische Phase der Aunjetitzer Kultur.

Das Isotopensignal für die Ernährung (C+N) der beiden Frauen entspricht im Großen und Ganzen dem eher homogenen Signal der gesamten Gemeinschaft und weist Werte auf, die typisch für mitteleuropäisch bäuerliche Gemeinschaften dieser Zeit sind: Konsumenten einer terrestrischen, auf C3-Pflanzen basierenden Ernährung mit einem mittleren Anteil an tierischer Produkte. Die beiden hatten insofern keine Sonderstellung, was ihre Ernährung anbetrifft (Ernée und Langová *et al.* 2020, 471–478).

Die wahrscheinlich mehr als 55 Jahre alte Frau aus Grab 12 weist ein zu den örtlichen Werten grenzwertiges Sr-Signal auf (Ernée und Langová *et al.* 2020, 479–489 Abb. 322). Genetisch geht es um eine Frau, die nur über ihre (neben ihr bestattete) Tochter mit der Gemeinschaft genetisch verbunden war. Darüber hinaus hatte sie nur zwei entfernte genetische Beziehungen zu zwei weiteren Skeletten aus zwei verschiedenen biologischen Verwandtschaftsgruppen (Familien).[2] Die Frau könnte im Rahmen der regionalen Mobilität der Frauen (Frauen-Exogamie) in die Mikulovice-Gemeinschaft gekommen sein.

Die ziemlich junge Frau im Sterbealter von *ca.* 18–20 Jahren aus Grab 13 weist ein ortstypisches Sr-Isotopensignal auf (Ernée und Langová *et al.* 2020, 479–489), enge genetische Beziehungen zu ihrer Großmutter (bzw. Tante? — bestattet daneben) und weiter entfernte genetische Beziehungen zu anderen sechs Skeletten

2 Wie bei der Frau aus Grab 13 geht es hier um bisher unpublizierte Ergebnisse von aDNA-Analysen, die am Max Planck-Institut für evolutionäre Anthropologie in Leipzig durch das Team von Wolfgang Haak (Luka Papac u. w.) durchgeführt wurden.

von fünf verschiedenen biologischen Verwandtschaftsgruppen (Familien). Die Bestattete aus Grab 13 war also in die örtliche Gesellschaft ziemlich gut biologisch angebunden.

Vor allem im Zusammenhang mit den spätkupferzeitlichen (bzw. früheren) Metallurgen ist oft von mobilen, wandernden Metallurgen die Rede gewesen (s. o., auch Neupert 2006; Wrobel Nørgaard 2014; 2015). In unserem Fall waren die beiden Frauen in die lokale/regionale Gesellschaft integriert, welches sich durch die Mobilitätsisotopen und aDNA-Analyse bestätigt. Die Frau aus Grab 13 hatte ihre Großmutter in Mikulovice bestattet und hatte auch weitere genetische Beziehungen zu mehreren örtlichen Familien. Die Frau aus Grab 12 war zwar neu in der Gemeinschaft, wahrscheinlich aber aus den benachbarten regionalen Gemeinden, und hat dann weiter längere Zeit in Mikulovice gelebt, wo sie letztlich genauso wie ihre Tochter bestattet wurde. Beides spricht für ein eher langfristigeres Leben der beiden Frauen vor Ort oder in der unmittelbaren Nachbarschaft.

Die beiden Frauen gehörten sicher nicht zu den Ärmeren in der Gemeinde, was eindeutig die kompletten Schmuckgarnituren mit Nadeln, Hals- und Haarschmuck belegen. Aus dieser Sicht überrascht denn auch nicht das Vorkommen von bis jetzt in der Aunjetitzer Kultur ganz vereinzelten Spuren von Versilberung (vgl. Ernée und Langová *et al.* 2020, 412, 465–466 Abb. 281; vgl. Schimerová *et al.* 2023) einiger Bronzeschmuckstücke mit einer engen Silberfolie, die auf den Oberflächen von den meisten kupfernen Spiralröllchen und -ringen aus Grab 13 zu finden waren (Abb. 5 G, H, K). Wenigstens eine der beiden Feinschmiedinnen wurde also mit ihren Produkten ausgestattet und auch bestattet.

Die nahe Lage beider Gräber zueinander, die fast gleichen Schmuckgarnituren (die sich aber von allen anderen auf der Nekropole deutlich unterscheiden), und die ähnlichen Werkzeugsätze für Feinschmiedearbeiten sprechen dafür, dass zwischen beiden Frauen wahrscheinlich eine enge Beziehungen bestanden hat — und vermutlich auch, dass die beiden Frauen eine bestimmte Zeit in persönlichem Kontakt waren, und gleichzeitig lebten. Weil die genetischen Untersuchungen keine biologischen Beziehungen zwischen beiden Frauen bestätigt haben, müssen diese Beziehungen anderer — persönlicher, sozialer, beruflicher — Art gewesen sein.

ZUSAMMENFASSUNG

Aus den Frauengräbern 12 und 13 in Mikulovice stammen sowohl Werkzeuge, wie sie zur Aufbereitung von Edelmetallen nötig waren, als auch versilberte kupferne/bronzene Schmuckgegenstände. Auch die Kollektionen der Werkzeuge sind in beiden Gräbern sehr ähnlich. Die Lage der beiden Gräber dicht beieinander ist aus dieser Sicht wahrscheinlich auch kein Zufall, genauso wie die fast identischen Schmuckgarnituren beider Frauen (Abb. 5 E, F) – die auf der Nekropole sonst fehlenden Ringkopfnadeln, Halsketten aus (versilberten) kupfernen Spiralröllchen und als Ohr-/Haarschmuck verwendete Spiralringe – die sich von weiteren in der Nekropole festgestellten Schmuckgarnituren ganz klar unterscheiden. Wenigstens eine der beiden Frauen trug außerdem für diese Zeit einen einzigartigen versilberten Schmuck.

Aus allen diesen Gründen interpretieren wir diese beiden Gräber als Bestattungen von Gold-/Feinschmiedinnen, die in der Kleinregion langfristig lebten. Hinsichtlich der direkten Nachbarschaft beider Bestattungen in der Nekropole, den identischen Schmuckgarnituren und auch den beiden Werkzeug-Kollektionen gehen wir davon aus, dass sie in einer engen (sozialen, beruflichen) Beziehung standen. Dass die detaillierten Kenntnisse der Organisation des hochentwickelten frühbronzezeitlichen Metallhandwerks dabei immer noch weitgehend im Dunkeln liegen (Lauermann und Pany-Kucera 2013, 103), bleibt freilich unstrittig. Wie u. a. Katja Martin erwähnt, erscheint es heute als sehr wahrscheinlich, „dass die Kenntnisse der Metallurgie in weitaus breiteren Bevölkerungsteilen bekannt waren, als für uns heute nachvollziehbar“ (Martin 2019, 225). Auf einer Seite ist sicher mit wahrscheinlich großen Werkstätten zu rechnen, die mit riesigen Mengen von Hunderten Kilogramm oder gar Tonnen an Rohstoffen in der Lage waren, ein sehr breites Spektrum von Waffen, Werkzeugen, Schmuck und anderen Artefakten mit Hilfe verschiedenartiger hochentwickelter Techniken routinemäßig zu produzieren (vgl. Hänsel und Medović 2004; Kienlin 2007; siehe auch bei Rassmann 2011), wie sich das z. B. in einigen frühbronzezeitlichen Horten widerspiegelt (vgl. Ernée *et al.* 2024; Moucha 2005; Krenn-Leeb 2010; Meller 2013). Auf der anderen Seite dürfen wir sicher auch davon ausgehen, dass Einzelpersonen oder sehr kleine Haus- oder Familienbetriebe mit kleinen Mengen hochwertigen Materials wie z. B. Gold oder Silber zu tun hatten und ganz alleine in ihrem Dorf zu Hause arbeiteten. Zu dieser Art von Feinschmied dürften auch unsere zwei Frauen aus Mikulovice gehört haben. Dass die beiden ausgerechnet an einem wichtigen Knotenpunkt entlang der Bernsteinstraße anzutreffen waren (und umgekehrt), ist das Sahnehäubchen auf dem Kuchen.

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LITERATUR

Adams, J., Delgado-Raack, S., Dubreuil, L., Hamon, C., Plisson, H. und Risch, R., 2009. Functional analysis of macrolithic artefacts. *In:* F. Sternke, L. Eigeland und L.-J. Costa, Hrsg. *Non-flint raw material used in prehistory: old prejudices and new directions. Proceedings of the XV Congres UISSP (Lisboa 2006).* British Archaeological Reports, International Series 1939. Oxford: Archaeopress, 43–66.

Armbruster, B., 2006. Steingeräte des bronzezeitlichen Metallhandwerkers. *Ethnographisch-Archäologische Zeitschrift* 47, 163–191.

Armbruster, B. und Comendador Rey, B., 2015. Early gold technology as an indicator of circulation processes in atlantic Europe. *In:* M.P. Prieto Martínez und L. Salanova, Hrsg. *The Bell beaker Transition in Europe. Mobility and local evolution during the 3rd millenium BC*. Oxford: Oxbow Books, 140–149.

Bartelheim, M., 1998. *Studien zur böhmischen Aunjetitzer Kultur – Chronologische und chorologische Untersuchungen*, Universitätsforschungen zur prähistorischen Archäologie 46. Bonn: Habelt.

Bátora, J., 2000. *Das Gräberfeld von Jelšovce/Slowakei. Ein Beitrag zur Frühbronzezeit im nordwestlichen Karpatenbecken*, Prähistorische Archäologie in Südosteuropa 16. Kiel: Oetker-Voges.

Bátora, J., 2002. Contribution to the Problem of „Craftsmen" Graves at the End of Aeneolithic and in the Early Bronze Age in Central, Western and Eastern Europe. *Slovenská Archeológia* 50(2), 179–228.

Bátora, J., 2005. Hrobový inventár pohrebísk zo záveru eneolitu a staršej doby bronzovej jako indikátor „zamestnania" a sociálního postavenia pochovaných. Grabinventar der Gräberfelder aus der Frühbronzezeit als ein Indikator „der Beschäftigung" und der sozialen Stellung der Bestatteten. *Študijné zvesti Archeologického ústavu SAV* 37, 13–22.

Bátora, J., 2006. *Štúdie ku komunikácii medzi strednou a východnou Európou v době bronzovej. Studies on communication between Central and Eastern Europe in the Bronze Age*. Bratislava: Petrus Publishers.

Bertemes, F., 1989. *Das frühbronzezeitliche Gräberfeld von Gemeinlebarn. Kulturhistorische und paläometallurgische Studien*, Saarbrücker Beiträge zur Altertumskunde 45. Bonn: Habelt.

Bertemes, F., 2004. Frühe Metallurgen in der Spätkupfer- und Frühbronzezeit. *In:* H. Meller, Hrsg. *Der geschmiedete Himmel. Die Welt im Herzen Europas vor 3600 Jahren. Begleitband zur Sonderausstellung, Landesmuseum für Vorgeschichte, Halle (Saale) vom 15. Oktober 2004 bis 24. April 2005.* (Halle/Saale/) Stuttgart: Landesamt für Archäologie Sachsen-Anhalt, 144–149.

Bertemes, F., 2010. Die Metallurgengräber der zweiten Hälfte des 3. und der ersten Hälfte des 2. Jt. v. Chr. im Kontext der spätkupferzeitlichen und frühbronzezeitlichen Zivilisationen Mitteleuropas. *In: Meller und Bertemes 2010*, 131–162.

Bertemes, F. und Heyd, V., 1996. Définition et origine de l'Age du Bronze Ancien en Europe. *In:* C. Mordant und O. Gaiffe, Hrsg. *Cultures et sociétés du Bronze Ancien en Europe. Colloque „Fondements culturels, techniques, économiques et sociaux des débuts de l'Age du Bronze". Actes du 117e Congrès national des sociétés historiques et scientifiques, Clermont Ferrand, 27–29 octobre 1992*, Congrès National des Sociétés Savantes 117. Paris: Editions du CTHS, 13–36.

Bertemes, F. und Heyd, V., 2002. Der Übergang Kupferzeit/Frühbronzezeit am Nordwestrand des Karpatenbeckens – Kulturgeschichtliche und paläometallurgische Betrachtungen. *In:* M. Bartelheim, E. Pernicka und R. Krause, Hrsg. *Die Anfänge der Metallurgie in der alten Welt*, Forschungen zur Archäometrie und Altertumswissenschaft 1. Rahden/Westfalen: Verlag Marie Leidorf, 185–228.

Bertemes, F. und Heyd, V., 2015. 2200 BC – Innovation or Evolution? The genesis of the Danubian Early Bronze Age. *In:* H. Meller, H.W. Arz, R. Jung und R. Risch, Hrsg. *2200 BC – A Climatic Breakdown as a Cause for the Collapse of the Old World? 7. Mitteldeutscher Archäologentag vom 23. bis 26. Oktober 2014 in Halle (Saale)*, Tagungen des Landesmuseums für Vorgeschichte Halle 12. Halle (Saale): Landesamt für Denkmalpflege und Archäologie Sachsen-Anhalt, Landesmuseum für Vorgeschichte, 561–578.

Bertemes, F., Schmotz, K. und Thiele, W.-R., 2000. Das Metallurgengrab 9 des Gräberfeldes der Glockenbecherkultur von Künzing, Landkreis Deggendorf. *In:* M. Chytráček, J. Michálek und K. Schmotz, Hrsg. *Archäologische Arbeitsgemeinschaft Ostbayern/West- und Südböhmen. 9. Treffen, 23. bis 26. Juni 1999 in Neukirchen bei Hl. Blut*. Rahden/Westfalen: Verlag Marie Leidorf, 53–60.

Boutoille, L., 2019. Cushion stones and Company: British and Irish finds of stone metalworking implements from the Bell Beaker period to the Late Bronze Age. *In:* D. Brandherm, Hrsg. *Aspects of the Bronze Age in the Atlantic Archipelago and Beyond. Proceedings from the Belfast Bronze Age Forum 9–10 November 2013*, Archaeologia Atlantica – Monographiae 3. Hagen/Westfalen: Curach Bhán Publications, 203–217.

Delgado-Raack, S., Lull, V., Martin, K., Micó, R., Rihuete Herrada, Ch. und Risch, R., 2014. Die Silberschmiede von Tira del Lienzo, Totana, prov. Murcia, im Kontext der El Argar Metallurgie. *In: Meller et al. 2014*, 577–591.

Delgado-Raack, S., Lull, V., Martin, K., Micó, R., Rihuete Herrada, Ch. und Risch, R., 2016. The silversmith's workshop of Tira del Lienzo (Totana, Murcia) in the context of Iberian Bronze Age metalurgy. *Archaeometry* 58(5), 779–795.

Delgado-Raack, S. und Risch, R., 2006. La tumba n° 3 de Los Cipreses y la metalurgia argárica. *Alberca* 4, 21–50.

Delgado-Raack, S. und Risch, R., 2008. Lithic perspectives on metallurgy: An example from Copper and Bronze Age south-east Iberia. *In:* L. Longo und N. Skakun, Hrsg. *'Prehistoric Technology' 40 years later: Functional studies and the Russian legacy, proceedings of the international congress. Verona (Italy), 20–23 April 2005)*, British Archaeological Reports, International Series 1783. Oxford: Archaeopress, 235–252.

Dubreuil, L. und Savage, D., 2014. Ground stones: A synthesis of the use-wear approach. *Journal of Archaeological Science* 48, 139–153.

Dubreuil, L., Savage, D., Delgado-Raack, S., Plisson, H., Stephenson, B., Torre, I., Plisson, H. und Stephenson, B., 2015. Chapter 7. Current Analytical Frameworks for Studies of Use-Wear on Ground Stone Tools. *In:* J.M. Marreiros, J.F. Gibaja Bao und N.F. Bicho, Hrsg. *Use-Wear and Residue Analysis in Archaeology*. Cham: Springer, 105–158.

Ernée, M., 2015. *Prag-Miškovice. Archäologische und naturwissenschaftliche Untersuchungen zu Grabbau, Bestattungssitten und Inventaren einer frühbronzezeitlichen Nekropole*, Römisch-Germanische Forschungen 72. Darmstadt: Philipp von Zabern.

Ernée, M., Langová, M., Arppe, L., Bednář, P., Berger, D., Brügmann, G., Bíšková, J., Cvrček, J., Drtikolová Kaupová, S., Fairbank, V., Frolík, J., Heyd, V., Horáčková, L., Kaňáková, L., kmošek, J., Kočár, P., Kočárová, R., Křížová, Š., Kučera, L., Kyselý, R., Mihaljevič, M., Moravcová, K., Pernicka, E., Stránská, P., Sedláček, R., Šura, J., Švédová, J., Vargová, L., Velemínský, P., Vymazalová, K. und Zazvonilová, E., 2020. *Mikulovice. Early Bronze Age Cemetery on the Amber Road*, Památky archeologické Supplementum 21. Praha: Archeologický ústav Akademie věd České republiky.

Ernée, M., Smejtek, L., Kmošek, J., Daněček, D., Fikrle, M., Erban Kočergina, J., Cibulka, D. und Vlach, M., 2024. *Tursko. Depot starší doby bronzové ze středních Čech. An Early Bronze Age Hoard from Central Bohemia*, Památky archeologické Supplementum 22. Praha: Archeologický ústav Akademie věd České republiky.

Fitzpatrick, A.P., 2011. *The Amesbury Archer and the Boscombe Bowmen. Bell Beaker burials at Boscombe Down, Amesbury, Wiltshire. Excavations at Boscombe Down*, Wessex Archaeology Report 27. Salisbury: Wessex Archaeology.

Freudenberg, M., 2006. Cushion stones and other stone tools from early metalworking in Schleswig-Holstein. Some new aspects on local Bronze Age society. *In:* L. Astruc, F. Bon und V. Léa, Hrsg. *Normes techniques et pratiques sociales. De la simplicité des outillages pré- et protohistoriques.* XXVI Recontres Internationales d'archéologie et d'historie d'Antibes. Antibes: Éditions APDCA, 313–320.

Freudenberg, M., 2009. Steingeräte zur Metallbearbeitung – einige neue Aspekte zum spätneolithischen und frühbronzezeitlichen Metallhandwerk vor dem Hintergrund des Schleswig-Holsteinischen Fundmaterials. *Archäologisches Korrespondenzblatt* 39, 341–359.

Hänsel, B. und Medović, P., 2004. Eine Bronzegießerwerkstatt der frühen Bronzezeit in Feudvar bei Mošorin in der Vojvodina. *In:* B. Hänsel, Hrsg. *Parerga Praehistorica. Jubiläumsschrift zur Prähistorischen Archäologie. 15 Jahre UPA*, Universitätsforschungen zur Prähistorischen Archäologie 100. Bonn: Habelt, 83–111.

Hundt, H.-J., 1975. Steinerne und Kupferne Hämmer der frühen Bronzezeit. *Archäologisches Korrespondenzblatt* 5, 115–120.

Jockenhövel, A., 1982. Zeugnisse der primären Metallurgie in Gräbern der Bronze- und Alteisenzeit Mitteleuropas. *Archeologia Polski* 27, 293–301.

Jockenhövel, A., 1990. Bronzezeitlicher Burgenbau in Mitteleuropa. Untersuchungen zur Struktur Frühmetallzeitlicher Gesellschaften. *In:* T. Bader, Hrsg. *Orientalisch-ägäische Einflüsse in der europäischen Bronzezeit. Ergebnisse eines Kolloquiums vom 16.–19.10.1985 in Mainz*, Monographien Römisch-Germanisches Zentralmuseum Mainz. Forschungsinstitut für Vor- und Frühgeschichte 15. Bonn: Habelt, 209–228.

Kaiser, E., 2003. *Studien zur Katakombengrabkultur zwischen Dnepr und Prut*, Archäologie Eurasien 14. Mainz: Philipp von Zabern.

Kaiser, E., 2005. Frühbronzezeitliche Gräber von Metallhandwerkern mit Gußformen für Schaftlochäxte im osteuropäischen Steppenraum. *In:* B. Horejs, R. Jung, E. Kaiser und B. Teržan, Hrsg. *Interpretationsraum Bronzezeit. Bernhard Hänsel von seinen Schülern gewidmet*, Universitätsforschungen zur prähistorischen Archäologie 121. Bonn: Habelt, 265–291.

Kienlin, T., 2007. Von den Schmieden der Beile. Zur Verbreitung und Angleichung metallurgischen Wissens im Verlauf der Frühbronzezeit. *Praehistorische Zeitschrift* 82, 1–22.

Krenn-Leeb, A., 2010. Ressource versus Ritual – Deponierungsstrategien der Frühbronzezeit in Österreich. *In: Meller und Bertemes 2010*, 281–315.

Kuijpers, M.H.G., 2008. *Bronze Age metalworking in the Netherlands (c. 2000–800 BC). A research into the preservation of metallurgy related artefacts and the social position of the smith*. Leiden: Sidestone Press.

Lauermann, E., 2012. Das Grab einer Metallverarbeiterin aus dem Aunjetitzer Gräberfeld von Geitzendorf, Niederösterreich. Muss die Rolle der Frau in der frühen Bronzezeit neu überdacht werden? *Archäologie Österreichs* 23(1), 27–29.

Lauermann, E. und Pany-Kucera, D., 2013. Grab 3 aus dem Aunjetitzer Gräberfeld von Geitzendorf. Der Erste Nachweis einer Metallverarbeiterin in der Frühbronzezeit Niederösterreichs. *Slovenská archeológia* 61(1), 93–106.

Martin, K., 2014. Was bleibt … Der Metallurg und sein Handwerk im archäologischen Befund. *In: Meller et al. 2014*, 309–319.

Martin, K., 2019. Die Metallurgengräber der späten Kupfer- und frühen Bronzezeit Mitteleuropas – Der Metallurg und sein Handwerk im archäologischen Befund. *In: Meller und Bertemes 2019*, 225–244.

Meller, H., 2013. Der Hortfund von Nebra im Spiegel frühbronzezeitlicher Deponierungssitten. *In:* H. Meller, F. Bertemes, H.-R. Bork und R. Risch, Hrsg. 1600 – *Kultureller Umbruch im Schatten des Thera-Ausbruchs? 1600 – Cultural change in the shadow of the Thera-Eruption? 4. Mitteldeutscher Archäologentag vom 14.–16. Oktober 2011 in Halle (Saale)*, Tagungen des Landesmuseums für Vorgeschichte Halle 9. Halle (Saale): Landesamt für Denkmalpflege und Archäologie in Sachsen-Anhalt, Landesmuseum für Vorgeschichte, 493–526.

Meller, H. und Bertemes, F., Hrsg., 2010. *Der Griff nach den Sternen. Internationales Symposium in Halle (Saale) 16.–21. Februar 2005,* Tagungen des Landesmuseums für Vorgeschichte, Halle (Saale) 5. Halle (Saale): Landesamt für Denkmalpflege und Archäologie in Sachsen-Anhalt, Landesmuseum für Vorgeschichte.

Meller, H. und Bertemes, F., Hrsg., 2019. *Der Aufbruch zu neuen Horizonten. Neue Sichtweisen zur europäischen Frühbronzezeit. Abschlusstagung der Forschergruppe FOR550 vom 26. bis 29. November 2010 in Halle (Saale)*, Tagungen des Landesmuseums für Vorgeschichte Halle 19. Halle (Saale): Landesamt für Denkmalpflege und Archäologie Sachsen-Anhalt Landesmuseum für Vorgeschichte.

Meller, H., Risch, R. und Pernicka, E., Hrsg., 2014. *Metalle der Macht – Frühes Gold und Silber. Metals of power – Early gold and silver. 6. Mitteldeutscher Archäologentag vom 17.–19. Oktober 2013 in Halle (Saale)*, Tagungen des Landesmuseums für Vorgeschichte Halle 11. Halle (Saale): Landesamt für Denkmalpflege und Archäologie in Sachsen-Anhalt, Landesmuseum für Vorgeschichte.

Mihok, Ľ., Olexa, L. und Briančin, J., 1996. Spôsob výroby zlatých predmetov z doby bronzovej v Nižnej Myšle. *Archeologia Technica* 10, 5–15.

Mohen, J.-P., 1991. Les sépultures des métallurgistes du début des âges des métaux en Europe. *In:* C. Éluère und J.-P. Mohen, Hrsg. *Découverte du métal. Colloque Saint-Germain-en-Laye, 19–21 janvier 1989, Millénaires* 2. Paris: Picard, 131–142.

Moucha, V., 1989. Böhmen am Ausklang des Äneolithikums und am Anfang der Bronzezeit. *In:* M. Buchvaldek und E. Pleslová-Štiková, Hrsg. *Das Äneolithikum und die früheste Bronzezeit (14C 3000–2000 BC) in Mitteleuropa: kulturelle und chronologische Beziehungen. Acta des XIV. Internationalen Symposiums Prag-Liblice 20.–24.10.1986*, Praehistorica XV. Praha: Univerzita Karlova, 213–218.

Moucha, V., 2005. *Hortfunde der frühen Bronzezeit in Böhmen*. Praha: Archeologický ústav AV ČR.

Müller, D., 1987. Gräber von Metallwerkern aus der Glockenbecherkultur des Mittelelbe-Saale-Gebietes. *Ausgrabungen und Funde* 32, 175–179.

Müller, J., 2002. Modelle zur Einführung der Zinnbronzetechnologie und zur sozialen Differenzierung der mitteleuropäischen Frühbronzezeit. *In:* J. Müller, Hrsg. *Vom Endneolithikum zur Frühbronzezeit. Muster sozialen Wandels? Tagung Bamberg 14.–16. Juni 2001*, Universitätsforschungen zur Prähistorischen Archäologie 90. Bonn: Habelt, 267–289.

Nessel, B., 2012. Metallurgen im Grab – Überlegungen zur sozialen Einstufung handwerklicher Spezialisten. *In:* T.L. Kienlin und A. Zimmermann, Hrsg. *Beyond Elites. Alternatives to Hierarchical Systems in Modelling Social Formations. International Conference at the Ruhr-Universität Bochum, Germany, October 22–24, 2009*, Universitätsforschungen zur Prähistorischen Archäologie 215. Bonn: Habelt, 423–432.

Neupert, M., 2006. *Der „Wanderhandwerker". Archäologisch-ethnographische Untersuchungen*, Tübinger Texte 6. Rahden/Westfalen: Verlag Marie Leidorf.

Olexa, L., 1987. Gräber von Metallgießern in Nižná Myšla. *Archeologické rozhledy*, 39(3), 255–275.

Peška, J., 2022. Die soziale Stratifikation am Ende des Äneolithikums in Mähren. *Praehistorische Zeitschrift* 97(2), 495–521.

Rassmann, K., 2011. Metallverbrauch in der frühen Bronzezeit Mitteleuropas. Produktion, Zirkulation und Konsumtion, frühbronzezeitliche Metallobjekte als untersuchungsgegenstände einer archäologischen Wirtschaftsgeschichte. *In:* S. Hansen und J. Müller, Hrsg. *Sozialarchäologische Perspektiven. Gesellschaftlicher Wandel 5000–1500 v. Chr. zwischen Atlantik und Kaukasus*, Archäologie in Eurasien 24. Mainz: Philipp von Zabern, 341–363.

Rašková Zelinková, M., 2009. Nástroje z kančích klů z protoúnětického pohřebiště v Pavlově. *In:* J. Peška, *Protoúnětické pohřebiště z Pavlova*. Olomouc: Archeologické Centrum Olomouc, 369–381.

Risch, R., 2002. *Recursos naturales, medios de producción y explotación social. Un análisis económico de la industria lítica de Fuente Álamo (Almería), 2250–1400 antes de nuestra era*, *Iberia Archaeologica* 3. Mainz: Philipp von Zabern.

Rowlands, M.J., 1971. The archaeological Interpretation of prehistoric Metalworking. *World Archaeology* 3, 210–224.

Schimerová, E., Havlíková, M., Msallamová, Š. und Bláhová, Z., 2023. Identifying silver-coated surfaces on Early Bronze Age axes from Bohemia. *Journal of Archaeological Science: Reports* 47, 103820. https://doi.org/10.1016/j.jasrep.2022.103820

Vlaskin, N.M., 1999. Pogrebenie „metalurga" epoki srednej bronzy. *Donskaja Archeologia* 2(3), 65–68.

Wrobel Nørgaard, H., 2014. Are Valued Craftsmen as Important as Prestige Goods. Ideas about Itinerant Craftsmenship in the Nordic Bronze Age. *In:* S. Reiter, Hrsg. *Rooted in Movement. Aspects of Mobility in Bronze Age Europe*, Jutland Archaeological Society Publications 83. Højbjerg: Jutland Archaeological Society, 37–52.

Wrobel Nørgaard, H.W., 2015. Tracing the hand that Crafted. How Individual Working Traces Make Bronze Age Ornaments Talk. *In:* P. Suchowska-Ducke, S. Scott Reiter und H. Vandkilde, Hrsg. *Forging identities. The mobility of culture in Bronze Age Europe. Report from a Marie Curie project 2009–2012 with concluding conference at Aarhus University, Moesgaard 2012*, BAR International Series 2771. Oxford: British Archaeological Reports, 101–110.

Zich, B., 1996. *Studien zur regionalen und chronologischen Gliederung der nördlichen Aunjetitzer Kultur*, Vorgeschichtliche Forschungen 20. Berlin: de Gruyter.

Das Phänomen „Goldener Mensch“ – zu den Eliten im eisenzeitlichen Kasachstan

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KEYWORDS: *Iron Age, nomadic horse riders, kurgans, social inequality, gold, Kazakhstan*

Zusammenfassung

Soziale Ungleichheit manifestiert sich im eurasischen Steppengürtel der Eisenzeit in Prunkgräbern von Persönlichkeiten von hohem sozialem Rang.

Die sogenannten „Goldenen Menschen“ auf dem Gebiet des heutigen Kasachstans sind Gräber mit aufwendigen Grabausstattungen. Im Beitrag werden die bekanntesten Gräber und ihre Merkmale vorgestellt.

Abstract

Social inequality is characterised by magnificent burial mounds of individuals of high social rank in the Eurasian steppe belt during the Iron Age.

The so-called ‘Golden Men’ on the territory of present-day Kazakhstan are burials with elaborate grave belongings. This article presents the best-known graves and the characteristics of such ‘Golden People’.

EINLEITUNG

Zeugnisse der Eliten in der Vorgeschichte dokumentieren Machtverhältnisse vergangener Gesellschaften. Die Elite skythenzeitlicher Reiternomaden hat solche eindrucksvollen wie auch dauerhaften Monumente im Landschaftsraum des eurasischen Steppengürtels hinterlassen. Zahlreiche Grabmonumente und eine ausgezeichnete Erhaltung organischen Materials in einigen Gebieten ermöglichen einen Einblick in die Bestattungsrituale dieser spezifischen sozialen Gruppe des ersten vorchristlichen Jahrtausends.

SKYTHENZEITLICHE REITERNOMADEN IM EURASISCHEN STEPPENGÜRTEL

Skythenzeitliche Gruppen der Eisenzeit waren vom 9./8. bis zum 3./2. Jahrhundert v. Chr. mit ihren spezifischen Lebens- und Wirtschaftsformen sowie der kennzeichnenden Tierstilverzierung die Herrscher und Gestalter des Steppenraumes. Gekennzeichnet durch eine Vielzahl an Kulturgruppen bildeten sie am Beginn und in der Mitte des 1. Jahrtausends v. Chr. in den Steppen Osteuropas, in Westsibirien und Zentralasien eine einheitliche Wirtschafts- und Alltagskultur — Ähnlichkeiten bei der Bewaffnung, beim Pferdegeschirr sowie bei Verzierungen der Kleidung und Gürtel sowie bei künstlerischen Ausdrucksformen sind sichtbar.

SOZIALE UNGLEICHHEIT – DIE GRÄBER (KURGANE) DER ELITE

Das Thema der sozialen Ungleichheit lässt sich archäologisch innerhalb dieser Kulturgruppen in unterschiedlicher Form beobachten. Beispiele aus den Gebieten der heutigen Länder Kasachstan, Russland und der Ukraine verdeutlichen bei den reiternomadisch geprägten Gruppen gut sichtbare Merkmale von Ungleichheit, die besonders deutlich beim Bau und der Ausstattung der Grabanlagen (Kurgane) hervortreten. Soziale Ungleichheit manifestiert sich im eurasischen Steppengürtel der Eisenzeit in Prunkgräbern von Persönlichkeiten von hohem sozialen Rang. Diese Grabanlagen liegen weithin gut sichtbar im Landschaftsraum.

Die bekannteste Grabanlage des Landes Kasachstan ist der Kurgan von Issyk (Abb. 1). Aufgrund der reichen Ausstattung wird diese Bestattung der Elite zugewiesen. Das Grab nimmt in jeglicher Hinsicht eine besondere Stellung ein – es zeigt v. a. auch die politische Instrumentalisierung der Archäologie weit über 2000 Jahre später, denn die Objekte des Grabes haben den Status von Nationalsymbolen in der Republik Kasachstan erhalten.

Was kennzeichnet die Grabmonumente der Elite im eisenzeitlichen Kasachstan? Wie drückt sich soziale Ungleichheit in den Gräbern und Grabanlagen aus? Woher kamen die Macht und der Einfluss dieser bestatteten Persönlichkeiten, die diese Landschaftsmarker als letzte Ruhestätte bekamen? In welcher Weise werden Macht, Netzwerksysteme und Führungsstrukturen deutlich?

DER KURGAN VON ISSYK BEI ALMATY IM SÜDOSTEN DES LANDES KASACHSTAN

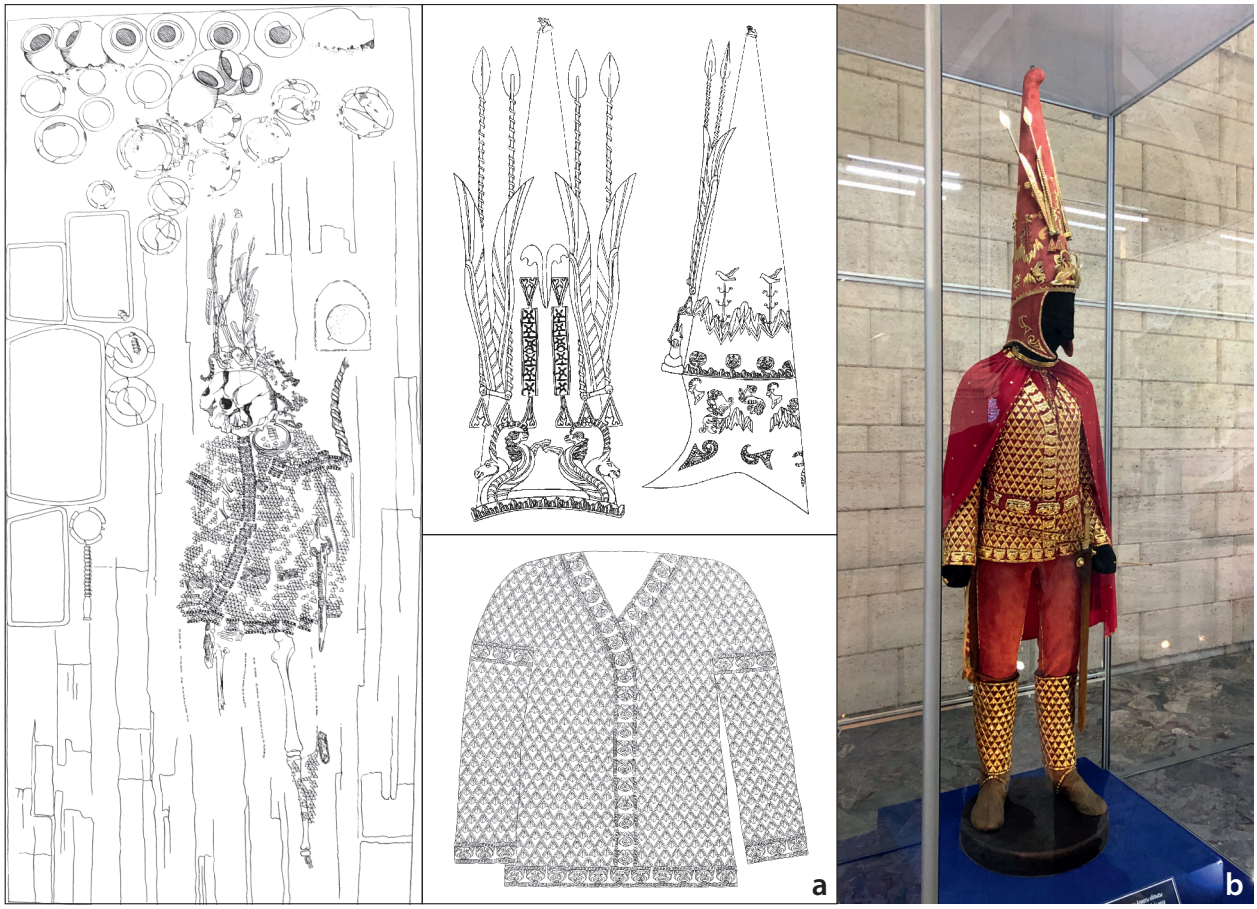

Abb. 1. ***a*** *Grabkammer und Teile der Ausstattung, I, 2–3 (Akishev 1978, Abb. 5; 62–63; 64);* ***b*** *Rekonstruktion in Lebensgröße des sogenannten Goldenen Menschen von Issyk, Zentralmuseum Almaty, Kasachstan (Foto: Karina Iwe).*

Die zentrale Bestattung des Kurgans war beraubt, wohingegen sich das südlich davon gelegene Grab als unberaubt erwies. Mit dieser Entdeckung eines Grabes (Abb. 1a, b; Tabelle 1–2) mit reicher Goldausstattung

einer bestatteten Person wurde die Bezeichnung „Goldener Mensch“ nachhaltig geprägt (Noyanuly und Yernazar 2016, 44), die inzwischen auch auf weitere Gräber des Landes übertragen wird. Gegenwärtig werden mindestens sechs weitere Gräber als Bestattungen sogenannter Goldener Menschen bezeichnet. Merkmal jener Gräber sind aufwendige Grabausstattungen, zu denen auch goldverzierte Kleidung gehört, die auf den hohen Sozialstatus der Verstorbenen schließen lassen.

Die Grabkammer der berühmten Nebenbestattung von Issyk wies ein Innenmaß von 2,9 x 1,5 m und ein Außenmaß von 3,3 x 1,9 m auf. Sie bestand aus Lärchenbalken und war die Grablege eines 17–18 Jahre alten Individuums. Im Grab konnten eine Reihe von Beigaben dokumentiert werden, darunter zahlreiche Objekte aus Gold (Tabelle 1).

Tabelle 1. Beigabenausstattung der Nebenbestattung, Issyk Kurgan (nach Akišev 1978).

Bestattetes Individuum (im nördlichen Teil der Grabkammer, Kopf im Westen): gestreckte Rückenlage	
Beigaben:	**Bekleidung:**
Halsring, Gold	aus rotem Filzstoff oder überzogen mit diesem
Fingerring an rechter Hand, mit der Darstellung eines menschlichen Kopfes, Gold	Oberbekleidung: kaftanartige Ärmeljacke
Gürtelverzierungen, Gold	Hose
Plättchen, mit der Verzierung von Tigerköpfen, Gold	halbhohe Stiefel
Plättchen, rechteckige Form	
Gürtelplatte, Darstellung eines Huftiers (Hirsch), Gold	
Gürtelverschluss, mit Tierdarstellung, Gold	
Schuhverzierung	
Ohrring am linken Ohr	
Bestandteile der konisch geformten hohen Kopfbedeckung (ca. 65 cm): u. a.	**Bewaffnung:**
Plättchen, in Gestalt eines Pferdes, Gold	Dolch-Imitat, Holz und Gold
Plättchen, mit ornamentaler Form, Gold	Schwert und Messer
Plättchen, in Form einer Raubkatze (Schneeleopard), Gold	
Plättchen, in Form einer Raubkatze (Schneeleoparden) mit mutmaßlicher stilisierter Berglandschaft, Gold	
Plättchen in Form einer mutmaßlich stilisierten „Berglandschaft“, Gold	
Diadem, Gold	
Vogelfiguren (2x), Gold	
Paarig dargestellte Huftiere, vermutl. Pferde – mit Flügeln, Gold	
Verzierung in Form von Pfeilen, Gold mit Basis aus Holz	
Weitere Beigaben:	
Spiegel, Bronze – in einem Täschchen (mit Goldverzierung)	
Gefäße aus Holz, Bronze und Ton (31 Tongefäße), Silbertasse mit Inschrift (an der westlichen Kammerwand)	
Tabletts (an der südlichen Kammerwand)	
Peitsche, mit Verzierung aus Gold	

Die zoomorphen Symbole zeigen komplizierte Kompositionen, sie spiegeln religiöse und mythologische Vorstellungen jener Gruppen wider. Sichtbar wird, dass die gesamte Kleidung der bestatteten Person mit Goldobjekten versehen war. Das Grab wird dem sakischen Kulturkreis zugeordnet.

DAS PHÄNOMEN DER „GOLDENEN MENSCHEN“

Die Bezeichnung „Goldener Mensch“ (Übersetzung aus dem Russischen: золотой человек; aus dem Kasachischen: Алтын адам/Altyn Adam) nimmt in der Archäologie Kasachstans Bezug auf ein herausragendes Grab der Eisenzeit: das Grab (Chang 2006, 112–122) von Issyk aus dem Südosten des Landes (Abb. 1a, b). Seit der Entdeckung dieses Grabes erfolgten weitere Graböffnungen und Hinweise zu weiteren „Goldenen Menschen“ aus dem 1. Jt. v. Chr. auf dem Gebiet des heutigen Kasachstans (Tabelle 2). Diese Gräber eint, dass sie eine reiche Ausstattung mit Goldobjekten in den Gräbern enthielten, die kunstvoll im Tierstil verziert waren.

Zu den Merkmalen „Goldener Menschen“ zählen:

- Aufwendige Grabbauten
- Zahlreiche Goldobjekte unter den Grabbeigaben
- Kleidung mit Goldbesatz
- Prächtig geschmückte, spitz hochzulaufende Kopfbedeckungen
- Rituelle Rolle
- Hoher sozialer Status

Die folgende Tabelle fasst kurz die wichtigsten Gräber zusammen, die seit der der Entdeckung von Issyk dem Phänomen „Goldene Menschen“ zugewiesen werden.

Tabelle 2. Gräber „Goldener Menschen“ der Eisenzeit, die in Kasachstan in den letzten Jahrzehnten entdeckt wurden.

	Fundplatz/Beigaben	Ausgrabungsjahr	Datierung	♀/♂-Alter
1	Issyk Kurgan, Transili-Alatau, Almaty (Gebiet, Siebenstromland; Akišev 1978; Samašev 2004) Zentralgrab kompl. beraubt, südlich davon gelegenes Grab unberaubt **Ausgräber**: Kemal Akišev **Beigaben**: u. a. Kleidung, Jacke, Hose, Spitzhut, besetzt mit Goldplättchen, Silbertasse mit Inschrift, Blattgold, Gefäße aus Holz, Bronze und Keramik **Höhe**: 6 m **Durchmesser**: 60 m Kopf im Westen	1969–1970	letztes Viertel 4. bis Anfang 3. Jh. v. Chr. (Chugunov 2014)	♀/♂? (Ismagilov 1995) 17–18 Jahre
2	Bajgetobe Kurgan, Nekropole von Šilikty, Zaisan District, Ostkasachstan, beraubt in Antike (Toleubayev *et al.* 2020, 3; Samašev 2008, 171; Toleubayev 2012, 53; Samašev 2004, 144) **Ausgräber**: Abdeš Toleubayev **Beigaben**: Akinakes, Schwert, Kaftan mit Verzierung von Adlergreifen, Rekonstruktion weist Halsring auf, der aber nicht im Grab gefunden wurde (vermutlich durch Grabräuber entwendet), 4303 Goldobjekte (Toleubayev *et al.* 2013, 1875; Andreeva 2024, 133) **Höhe**: 7,9 m **Durchmesser**: ca. 90 m	1950er Jahre, 2003	8. Jh. v. Chr. (Toleubayev *et al.* 2013, 1877) 730–690 cal BC – 2 σ (Panyushkina *et al.* 2016, 6)	♂ ca. 35–40 Jahre, ca. 178–180 cm
3	Araltobe Kurgan, 65 km von der Stadt Qulsary entfernt, Audan Schylyoi, Gebiet Atyrau, Westkasachstan (Samašev 2004, 164), beraubt, Sarmatisch **Ausgräber**: Zajnulla Samašev **Beigaben**: Grab (Kurgan Nr. 2) eines Mannes zusammen bestattet mit einer Frau, zwei Pferden, Hunden, Waffen, mehr als 300 Goldobjekte (Samašev 2008, 177; Andreeva 2024, 133; Samašev 2004, 163), Skelett eines Steinadlers (Samašev 2008, 177; Samašev 2004, 163) **Höhe**: 2 m **Durchmesser**: 40 m	1999	2. Jh. v. Chr.	♂ 45–55 Jahre

	Fundplatz/Beigaben	Ausgrabungsjahr	Datierung	♀/♂-Alter
	Taldy-2, Kurgane 1, 2, 4, 5 (Bejsenov 2017, 89), Karkaraly District, Gebiet Karaganda			
	Beigaben: Verzierung der Kleidung, vermutlich auch verzierte Kopfbedeckung u. a. mehr als 200 Goldobjekte in diesen Gräbern (v. a. in den Kurganen 2 und 5; Andreeva 2024, 133)			
4	Taldy-2, Kurgan Nr. 2, Grab 1 (Bejsenov 2017, 89)	2009–2010	7./6. Jh. v. Chr. (Bejsenov *et al.* 2011, 21)	♀; ♂; beide ca. 50–55 Jahre (Bejsenov 2013, 599)
	Ausgräber: Arman Bejsenov			
	Beigaben: Goldobjekte			
	Höhe: ca. 3,5 m			
	Durchmesser: 55,0 m			
	(Bejsenov *et al.* 2011, 21)			
	Taldy-2, Kurgan Nr. 5, Grab 1	2009–2010	7./6. Jh. v. Chr. (Bejsenov 2013, 606; Bejsenov *et al.* 2011, 21)	♂ 30–35 Jahre (Bejsenov 2013, 599)
	Ausgräber: Arman Bejsenov			
	Beigaben: Goldobjekte			
	Höhe: 2,1 m			
	Durchmesser: 30,0 m			
	(Bejsenov *et al.* 2011, 21)			
5	Taksaj I, Kurgan 6, Grab 3, Terekti District, Westkazachstan, unberaubt (Summerer und Lukpanova 2020, 588), Sarmatisch	2012	6–5. Jh. v. Chr. (Summerer und Lukpanova 2020, 588)	♀ 17–20 Jahre
	Ausgräber: Ausgrabung unt. Leitung v. Marat Sdykov			
	Beigaben: Bestattung einer Frau (zentrales Grab), Skelett schlecht erhalten wegen Feuereinwirkung (Summerer und Lukpanova 2020, 590), u. a. 80 Goldobjekte (Andreeva 2024, 133), Kamm aus Pappelholz mit Kampfszene, verzierte Kleidung (u. a. konusförm. Kopfbedeckung), Halsgoldreif, Spiegel, Glasgefäß, Bronzekessel, 4 Pferdegeschirre			
	Erhaltene **Höhe**: 1 m			
	Erhaltener **Durchmesser**: 25–45 m			
6	Eleke-2, Kurgan 4, Tarbagatay District, Ostkasachstan (Samashev 2021)	2018 (Samashev 2021, 69)	8. Jh. v. Chr. (Samashev 2021, 101)	♂ 17–18 Jahre
	Bestattung von zwei Individuen (u. a. ca. 15j. weibliches Individuum und männliches Individuum)			
	Ausgräber: Zajnulla Samašev			
	Beigaben des männlichen Individuums: unberaubt, u. a. Bronzedolch mit goldverzierter Scheide, Goryt, Goldhalsreif, vermutlich mit verzierter Kopfbedeckung, verschiedene Goldobjekte, Spiegel			
	Höhe: 1,60 m			
	Durchmesser: 33,25 m			
7	Kurgan, Taskopa, Temir Rajon, Aqtöbe (Gebiet) (Website 2019), Sarmatisch, beraubt	2019	4–3. Jh. v. Chr.	
	Ausgräber: Arman Bejsembaev			

Aus verschiedenen Teilen des Landes (Abb. 2) sind „Goldene Menschen“ bekannt, also reiche Gräber von Männern wie Frauen mit Goldbeigaben, die v. a. die Bekleidung verzierten, aber auch Goldobjekte wie Halsreife in den Gräbern von Issyk oder Eleke-2 aufweisen (Statussymbole), die der Elite eisenzeitlicher Kulturgruppen zugeordnet werden. Sie treten innerhalb der Bestattungsplätze gemeinsam mit zahlreichen weiteren Kurganen auf, die unterschiedliche Größen aufweisen. Im Bereich von Šilikty treten beispielsweise über 200 Monumente der Früheisenzeit auf, darunter ca. 120 Kurgane der sakisch-skythischen Zeit im Zentrum des Tals (Toleubayev *et al.* 2020, 2).

Abb. 2. Lage der Gräber mit „Goldenen Menschen" auf dem Gebiet Kasachstans (Grafik: Karin Winter).

Diese Tradition, den Toten mit einer hohen Zahl an verzierten Goldobjekten zu bestatten, vor allem Objekte, die die Kleidung verzieren, findet ein frühes Beispiel in Tuva, Südsibirien — mit dem unberaubten Grab eines Mannes und einer Frau am Fundplatz von Aržan 2 (Grab 5, Chugunov 2014; Čugunov *et al.* 2010). Diese Denkmäler werden ebenfalls der Elite zugesprochen.

Die mit hoher Stückzahl an Goldobjekten verzierte Kleidung (v. a. Aufnähplättchen) ist ein zentrales Element bei den „Goldenen Menschen". Die komplexen Kopfbedeckungen im Tierstil geben weiterhin Einblick in die geistig-religiöse Vorstellungswelt dieser Gruppen (Iwe 2022). Form und Ausstattung sorgten bei Zeremonien für eine gute Sichtbarkeit des Trägers bzw. der Trägerin. Die sorgfältig ausgeführten Artefakte des skythisch-sibirischen Tierstils sind unter Berücksichtigung bestehender Glaubensvorstellungen und weniger auf Grundlage künstlerisch- ästhetischer Werte, geschaffen worden. Sie erlauben dem Betrachter, Grundzüge des komplexen Geflechts der Weltanschauungssysteme im 1. Jt. v. Chr. zu erkennen. Die Darstellungen sind durch die zahlreichen Bildmotive auf verschiedenen Objekten (Bildträger) bekannt geworden. Die Gegenstände mit dem charakteristischen Tierstil treten in variationsreichen und doch auch wiederholend ausgeführten Ansichten und Motiven innerhalb jener Kulturgruppen des 1. Jt. v. Chr. im Steppengürtel auf.

SOZIALE UNGLEICHHEIT

Die Grabanlagen der Elite geben einen Einblick in die Verteilung von Macht innerhalb der skythenzeitlichen Gesellschaft. Die Manifestation von Macht wird beispielsweise durch Aufwand und Größe bei der Errichtung der Grabanlagen für die Mitglieder der Elite, Männer wie Frauen, sichtbar. Die (politische) Macht der Herrscher verweist auf hierarchisch gegliederte soziale Strukturen und kommt in den folgenden Bereichen im Bestattungsritus zum Ausdruck:

Merkmale der Grabanlagen:

- Grabanlagen einer Elite, die ihren Machtanspruch in Form von imposanten und komplexen Grabanlagen versinnbildlicht (z. B. Issyk: Dm. 60 m)

  a. Aufwand und Zeit für die Errichtung der Grabhügel (u. a. Steinpanzer und Erdaufschüttungen) — Größe der Kurgane als soziales Zeichen (Toleubayev *et al.* 2013, 1877)

b. Kurgane innerhalb der Bestattungsareale gut sichtbar und damit herausragend

- Ausstattung der Gräber: Grabbeigaben dokumentieren Zugang zu speziellen Ressourcen, Hinweise auf das Netzwerksystem dieser Elite
- Elite hatte Zugang zu materiellen Ressourcen (z. B. Gold) – Goldbeigaben in den Gräbern werden von den Ausgräbern als Zugehörigkeit zur Elite interpretiert.

a. Große Mengen an Gold als Grabausstattung der Elite vorbehalten (Exklusivität) – zahlreiche Goldobjekte in den Gräbern als Beigaben
b. Goldobjekte werden als Verzierung der Bekleidung der Toten verwendet
c. Goldobjekte wirken reflektierend auf Sonnenlicht – besonderes Spektakel bei Bewegung/Transport des Leichnams: Gold bekleidet die Toten, hebt Partien des Körpers hervor, verändert den Körper = politisches Statement (Andreeva 2024, 124)
d. Botschaft an die Beiwohnenden des Spektakels rund um die Bestattungszeremonie: anhaltende Macht, Reichtum und Zugang zu Ressourcen auch nach dem Ableben eines Mitglieds der Elite

Merkmale des Bestattungsschauspiels:

- Optik und Spektakel als Merkmale der Bestattungszeremonie der Elite
- Bestattungszeremonie als sensorisches Spektakel für die Teilnehmenden (Andreeva 2024, 123)
- Spektakel (Bestattungsvorgang) als Teil der kollektiven Erinnerung der Gemeinschaft
- Botschaft des Spektakels: Macht und Stabilität ausstrahlen – Konsolidieren von strategischen Allianzen
- Zurschaustellung von Reichtum, Status und Netzwerken
- die Gräber mit „Goldenen Menschen“ sind nicht immer die zentralen Gräber der Anlage, z. B. Issyk

Den Traditionen zufolge erhielten diese Mitglieder der Elite sehr aufwendige Grablegen. Welche Rolle sie zu Lebzeiten einnahmen, kann nur vermutet werden:

- Soziale und symbolische Funktionen,
- Rolle als Anführer und Anführerinnen,
- rituelle Anführer

Über Jahrhunderte ist ein Fortbestehen des Systems sozialer Ungleichheit bei den Mächtigen der skythenzeitlichen Reiternomaden zu beobachten.

POLITISCHE DIMENSION: NATIONALSYMBOLE

Die Objekte aus dem Kurgan von Issyk, jenem bekanntesten archäologischen Befund der verhältnismäßig jungen zentralasiatischen Republik, zeugen von der hohen kulturellen Entwicklung der damaligen Gemeinschaften und fungieren mittlerweile als nationale Symbole (Iwe und Franke-Schwenk 2020; Iwe *et al.* 2022).

Dies führte dazu, dass der „Goldene Mensch“ Wahrzeichen des unabhängigen Kasachstans wurde. So werden unter anderem Elemente aus dem Grab von Issyk innerhalb des Unabhängigkeitsdenkmals der Republik Kasachstan am Platz der Republik in der ehemaligen Hauptstadt Almaty präsentiert. Im Zentrum der Stadt steht dieses Monument zur Unabhängigkeit Kasachstans und weist weithin sichtbar eine Statue mit dem goldenen Menschen in 28 m Höhe auf — auf einem geflügelten Schneeleoparden stehend. Der Künstler dieses Monuments aus dem Jahre 1996 ist Adilet Zhumabai (Kairanov und Karymsakov 2012, 2282).

Weitere Darstellungen entdeckt man im weithin sichtbaren Bajterek-Turm in der Hauptstadt Astana (Abb. 3a). Dieser zeigt hoch oben nicht nur den vergoldeten Handabdruck des ehemaligen Präsidenten (Nursultan Nasarbajew), sondern auch Darstellungen des Tierstils von Objekten wie dem Gürtel oder der Kopfbedeckung aus dem bekanntesten Grab der Eisenzeit des Landes (Issyk) — präsentiert in Form eines umlaufenden Frieses (Abb. 3b, c). Hier werden die Instrumentalisierung der Funde und die Verknüpfung mit einem politisch symbolträchtigen Ort für das Narrativ der Herrscherrepräsentation deutlich. Schmuck und Gold beeindruckten nicht nur die Herrscher vor ca. 2300 Jahren.

Diese Beispiele unterstreichen die politische Instrumentalisierung der Archäologie — als wichtige Quelle des noch jungen Staates Kasachstan.

Abb. 3. Der Bajterek-Turm in der Hauptstadt Astana. ***a*** *Sicht auf den Bajterek-Turm,* ***b*** *Pult mit Handabdruck, mit umlaufendem Fries,* ***c*** *Details aus dem Grab von Issyk (Fotos: Karina Iwe).*

BOTSCHAFTER EINES LANDES

In Kasachstan begegnet man dem Motiv des „Goldenen Menschen" sehr häufig im öffentlichen Raum. Darstellungen mit Anlehnung zum „Goldenen Menschen" finden sich auch in der Gegenwartskunst (Kairanov und Karymsakov 2012, 2285) wie etwa bei Nuržan Karymsak mit der Arbeit "*The Golden Warrior, Saka Battle*" (Öl auf Leinwand, 2001) oder auch bei Agimsaly Duzel'khanov mit dem Werk "*The Saka Prince*" (Öl auf Leinwand, 1999). Weiterhin tourt seit einigen Jahren eine Ausstellung mit dem Titel "*The Golden Man*" durch die Welt, die bereits etliche Ausstellungsorte aufweisen kann: The Heritage of the Great Steppe: Masterpieces of Jewelry Art (Xi'an) / The Procession of Altyn Adam (Golden Man) [Athen], The Great Steppe: history and culture (Ankara).

Beim Phänomen „Goldener Mensch" ist immer wieder zu beobachten, dass es mitunter fälschlicherweise zu einem Fehler bei der Übersetzung von золотой человек kommt, weshalb man häufig „Goldener Mann" liest. Mit Bezug auf das Grab von Issyk ist das besonders herausfordernd, da es nicht als gesichert gilt, dass ein männliches Individuum bestattet war – die Knochenerhaltung war äußerst schlecht.

Weiterhin ist zu beobachten, dass häufig in den Medien der Reflex besteht, Gräber mit reicher Goldausstattung der Kategorie „Goldener Mensch" zuzuordnen.

Die Gräber mit „Goldenen Menschen" geben einen Einblick in die Bekleidung und Verteilung der Verzierung der bestatteten Elite der Eisenzeit auf dem Gebiet Kasachstans — und damit in den Bereich sozialer und politischer Ungleichheit der Vorgeschichte. Zudem kennzeichnen sie einen faszinierenden Teil der Archäologie dieser Region.

LITERATUR

Andreeva, P., 2024. *Fantastic Fauna from China to Crimea. Image-Making in Eurasian Nomadic Societies, 700 BCE–500 CE*. Edinburgh: Edinburgh University Press.

Akišev, K.A., 1978: Акишев, К.А., 1978. *Курган Иссык. Искусство саков Казахстана*. Москва: Искусство.

Bejsenov *et al.* 2011: Бейсенов, А.З., Таиров, А.Д., Зайков, В.В. und Блинов, И.А., 2011. *Состав золотых изделий из могильника Талды-2 (Центральный Казахстан) // Сакская культура Сарыарки в контексте изучения этносоциокультурных процессов степной Евразии*. Караганды: Институт археологии им. А.Х. Маргулана, 21–25.

Bejsenov, A., 2013. Die Nekropole Taldy 2 in Beziehung zu den Kulturen der frühsakischen Zeit Osteurasiens, *In*: T. Stöllner und Z. Samašev, Hrsg. *Unbekanntes Kasachstan*, Archäologie im Herzen Asiens 2. Bochum: Deutsches Bergbau-Museum, 595–608.

Bejsenov, A.Z., 2017: Бейсенов, А.З., 2017. *Казахстан в сакскую эпоху*. Almaty: Институты археологии. https://archeo.kz/en/library/monografii/kazahstan-v-sakskuyu-epohu/read/ ; letzter Zugriff 10. März 2025

Chang, C., Hrsg., 2006. *Of Gold and Grass. Nomads of Kazakhstan*. Bethesda: Foundation for International Arts & Education.

Čugunov, K., Parzinger, H. und Nagler, A., Hrsg., 2010. *Der skythenzeitliche Fürstenkurgan Aržan 2 in Tuva*, Archäologie in Eurasien 26, Steppenvölker Eurasiens 3. Mainz: Philipp von Zabern.

Chugunov, K.V., 2014: Чугунов, К.В., 2014. Захоронения “золотых людей” в традиции номадов Евразии (новые материалы и некоторые аспекты исследований), *In*: Т.С. Садыков (Главный редактор) М.К. Хабдулина (Ответственный редактор), *Диалог культур Евразии и археология Казахстана*. Нур-Султан: Астана, 714–724.

Ismagilov, R.B., 1995: Исмагилов Р.Б., 1995. “Золотой воин” из кургана Иссык: мужчина или женщина, *In*: *Наследие веков. Охрана и изучение памятников археологии в Башкортостане*. Вып. 1. Уфа, 110–114.

Iwe, K. und Franke-Schwenk, A., 2020. *The Image of the Snow Leopard in the Archaeological Records of Kazakhstan and its Intrumentalization in Modern-Day Political Agenda, Voices on Central Asia*. https://voicesoncentralasia.org/the-image-of-the-snow-leopard-in-the-archaeological-records-of-kazakhstan-and-its-instrumentalization-in-modern-day-political-agendas/ ; letzter Zugriff 6. März 2025

Iwe, K., Schmuhl, Y. und Wolfram, S., Hrsg., 2022. *Chic! Schmuck. Macht. Leute*, Ausstellungskataloge des Staatlichen Museums für Archäologie Chemnitz 5. Dresden: SMAC – Staatliches Museum für Archäologie Chemnitz.

Iwe, K., 2022. *Studien zum Tierstil skythenzeitlicher Reiternomaden im eurasischen Steppengürtel. Mehrfigurige Kompositionen der älteren Eisenzeit*. Berlin: Peter Lang.

Kairanov, Y.B. und Karymsakov, A.Z., 2012. The Influence of Ancient Artifacts on Contemporary Culture (exemplified by the Painting and Sculpture of Kazakhstan), *World Academy of Science, Engineering and Technology International Journal of Humanities and Social Sciences* 6(8), 2281–2287.

Noyanuly, N.E. und Yernazar, S., 2016. The “golden” people of Kazakhstan, *World Science* 12(16), Vol. 3, 44–48.

Panyushkina, I.P., Slyusarenko, I.Y., Sala, R., Deom, J.-M. und Toleubayev, A.T., 2016. Calendar Age of the Baigetobe Kurgan from the Iron Age Saka Cemetery in Shilikty Valley, Kazakhstan. *Radiocarbon* 58(1), 157–167. https://doi.org/10.1017/RDC.2015.15

Samašev *et al.* 2004: Самашев, З., Толеубаев, А., Джумабекова, Г.,2004. *Сокровища степных вождей*. Алматы: Берел.

Samašev 2008: Самашев, З., 2008. Древние всадники казахских степей, *In*: *Номады казахских степей: этносоциокультурные процессы и контакты в Евразии скифо-сакской эпохи. Astana 2008*, 169–180.

Samashev, Z., 2021. Eleke Sazy, Kurgan 4, *In*: R. Roberts, Hrsg. *Gold of the Great Steppe*. London: Paul Holberton Publishing, 69–101.

Summerer, L. und Lukpanova, Y., 2020. The wooden comb of the ‘golden lady’: a new battle image from the Taksai-1 kurgan (western Kazakhstan). *In*: S.V. Pankova und J. Simpson, Hrsg. *Masters of the Steppe: The Impact of the Scythians and Later Nomad Societies of Eurasia: Proceedings of a conference held at the British Museum, 27–29 October 2017*. Oxford: Archaeopress, 588–604. https://doi.org/10.2307/j.ctv1fcf8hh.48

Toleubayev, A., Zhumatayev, R. und Shakenov, S., 2020. Reconstruction of the Costume Elements of the Shilikty “Golden Man”. *Rupkatha Journal on Interdisciplinary Studies in Humanities* 12(6), 1–20. https://dx.doi.org/10.21659/rupkatha.v12n6.21

Toleubayev, A., Zhumatayev, R. und Toleubayeva, K., 2013. Royal Mound “Baygetobe” from the Burial Ground Shilikty, *World Academy of Science, Engineering and Technology International Journal of Humanities and Social Sciences* 7(6), 1874–1878.

Toleubaev, A.T., 2012. Results of multi-disciplinary studies and reconstructions of materials from the Baigetobe kurgan at Shilikty, *In*: S. Stark, K.S. Rubinson, Z. Samashev und J.Y. Chi, Hrsg. *Nomads and Networks: The Ancient Art and Culture of Kazakhstan*. Princeton: Princeton University Press, 51–61.

Website, 2019. Institute Archeology named A.Kh. Margulan, В Актюбинской области нашли своего “золотого человека”. https://archaeolog.kz/index.php?option=com_content&view=article&id=332%3A-q-q&catid=26%3A2019-04-11-11-09-50&Itemid=29&lang=en ; letzter Zugriff 14. Juli 2024

The Early Catacomb Culture and Its Absolute Chronology [1]

Elke Kaiser

KEYWORDS: *Catacomb Culture, Middle Bronze Age, Eastern European steppe, ^{14}C dates*

Abstract

This contribution deals with the absolute chronology of the Early Catacomb Culture. Large structures in 'T-shape' form are typical of the graves of the early phase of the Catacomb Culture. In the burial chambers, the deceased usually lie on their side with slightly drawn up legs. Graves with these characteristics were discovered in burial mounds (kurgans) between the Dnipro River in the west and the northwestern Caspian Sea in the east. The heartland of their distribution lies in the steppes north of the Caucasus and reaches as far as the lower Don River. The relative- and absolute-chronological relationships extending from the Early Catacomb Culture to the Yamnaya and Catacomb Cultures of the advanced phase have been discussed repeatedly and controversially in research. This paper discusses various aspects of the radiocarbon dates for graves from burial mounds in the western Eurasian steppe zone by means of sum calibrations. To date, they have only facilitated a comparatively schematic absolute chronology for the archaeological cultures present in this region. Using Bayesian modelling, the Early Catacomb Culture is dated between 2800 and 2500 cal BC. Even though the number of kurgan stratigraphies with a sufficient number of radiocarbon dates is still very limited, the results suggest that graves with the typical Early Catacomb characteristics were built in parallel to graves of the Late Yamnaya Culture, sometimes in the same burial mounds.

Zusammenfassung

Der vorliegende Beitrag befasst sich mit der absoluten Chronologie der Frühen Katakombengrabkultur. Die typischen Merkmale der Gräber der frühen Phase der Katakombengrabkultur sind große Konstruktionen, die sogenannte T-Form. In den Grabkammern liegen die Toten zumeist auf der Seite mit leicht angezogenen Beinen. Gräber mit diesen Kennzeichen wurden in Grabhügeln zwischen dem Dnipro im Westen und der nordwestlichen Kaspi-See im Osten gefunden. Das Kerngebiet der Verbreitung liegt in den Steppen nördlich des Kaukasus und reicht bis zum unteren Don. Das relativ- und absolutchronologische Verhältnis der Frühen Katakombengrabkultur zur Jamnaja und den Katakombengrabkulturen der entwickelten Phase ist in der Forschung wiederholt und kontrovers diskutiert worden. Anhand von Summenkalibrationen werden zunächst verschiedene Aspekte der Radiokarbondatierungen für Grabhügelbestattungen in der westeurasischen Steppenzone besprochen, die bislang nur eine recht schematische absolute Chronologie für die hier verbreiteten archäologischen Kulturen ermöglichen. Mit Hilfe von Bayes'schen Modellierungen kann die Frühe Katakombengrabkultur zwischen 2800 und 2500 cal BC eingeordnet werden. Auch wenn die Zahl an Kurganstratigraphien, für die ausreichend Radiokarbondatierungen vorliegen, noch sehr begrenzt ist, legen die Resultate nahe, dass frühe Katakomben mit den für sie typischen Kennzeichen parallel zu den Gräbern der späten Jamnaja-Kultur angelegt worden sind, teilweise sogar in ein und demselben Grabhügel.

1 My sincere thanks go to Tora von Collani for the translation of the manuscript into English and to Brian Poole for the linguistic editing.

INTRODUCTION

This contribution deals with the absolute chronology of the Early Catacomb Culture and thus touches on two subjects that I have in common with Johannes Müller. When he worked as a research associate at the Seminar für Ur- und Frühgeschichte (now the Institut für Prähistorische Archäologie/Institute of Prehistoric Archaeology) in Berlin, he often discussed the potential of typology-independent dating with students and doctoral candidates and gave us an in-depth introduction to the analysis of radiocarbon dates. At the time I was writing my dissertation on the Catacomb Culture between the Dnipro and Prut Rivers (Kaiser 2003). Johannes was a member of my doctoral committee and an important colleague for me converse with while I was preparing to defend my thesis. I would therefore like to bring both topics together in this publication on the occasion of his anniversary.

In Eastern European research, archaeological cultures are usually considered to be monothetic units: they are classified in finite time frames. At the beginning of the 20th century, the Bronze Age in the western Eurasian steppe zone was divided into three periods that were also supposed to correspond to archaeological cultures (Gorodtsov 1907): the Yamnaya, Catacomb, and Srubnaya Cultures. This periodization was based on the sequence of graves determined in the burial mounds of today's Eastern Ukraine and was verified by excavating burial mounds in many other areas during the following decades. Since the 1970s at the latest, however, it has also become clear that these mounds — referred to as 'kurgans' in Russian — also contain graves whose layout and burial customs differ from those of the three cultures. These include graves that are assigned to the Early Catacomb Culture and that — according to the interpretation of many archaeologists — should precede the regional variants of the advanced phase of the Catacomb Culture. This contribution is mainly about such graves. More recently, burial practices of the so-called Post-Catacomb Cultures have also been defined. These include the Babyne Culture (Litvinenko 2001), mainly located in Ukraine, and the Lola and Krivoy Luk Cultures (Mimokhod 2013). The previous periodization of the Bronze Age therefore obviously needs to be expanded; in addition, numerous archaeological cultures are limited to certain regions instead of being spread throughout the entire steppe zone, such as the Novotitarovskaya Culture in the Kuban region.

A reassessment of the entire Bronze Age in the western Eurasian steppe in the light of absolute dates would exceed the spatial limits of the present essay — even sticking to the Catacomb Culture alone would be out of proportion here. I will therefore focus on the Early Catacomb Culture and the question whether it really is an early horizon within the Catacomb Culture, as the name suggests, or whether it should be treated as an independent archaeological culture.

To do so, I will first briefly present the archaeological evidence assigned to the Early Catacomb Culture and outline various interpretative approaches. I will then — essentially restricting myself to the Yamnaya and Catacomb Cultures — elaborate the radiocarbon data that has yielded relatively long durations for the Bronze Age cultures with long overlaps. These temporal overlaps may be interpreted as an indication that different burial customs existed simultaneously in the western Eurasian steppe during the 3rd millennium BCE. However, we cannot rule out that, after calibration, these long temporal overlaps are rooted in various issues of radiocarbon dating. We shall therefore examine this issue by means of stratigraphic sequences from the few burial mounds for which ^{14}C dates exist. If Bayesian modelling of the data from the graves assigned to the Early Catacomb Culture yields similar timespans, we have a weighty argument in favour of the prevailing opinion in research that these graves correspond to an early phase of the Catacomb Culture.

THE EARLY CATACOMB CULTURE

Tatyana B. Popova (1955) wrote the first and, to date, only monograph on the Catacomb Culture in its entire distribution area. She was the first to subdivide it spatially into different regional variants and to distinguish three phases. But she did not yet interpret the early phases in the regional variants as potentially independent phenomena. This was only the case later on, after excavations of kurgans during Soviet times revealed thousands of additional graves that were assigned to the Catacomb Culture. Many archaeologists then recognized that, between the graves of the Yamnaya Culture and those of the Catacomb Culture, there were burials inside the mounds that were mostly located in a catacomb, but whose burial rites and grave goods were more similar to the preceding Yamnaya Culture. These graves were accordingly described — the earliest works on the topic were published as early as the 1960s and 1970s — and referred to as the Early Catacomb Culture (on the history of research, see Kiyashko 1999, 12; Stegantseva 2020). In the following decades, the

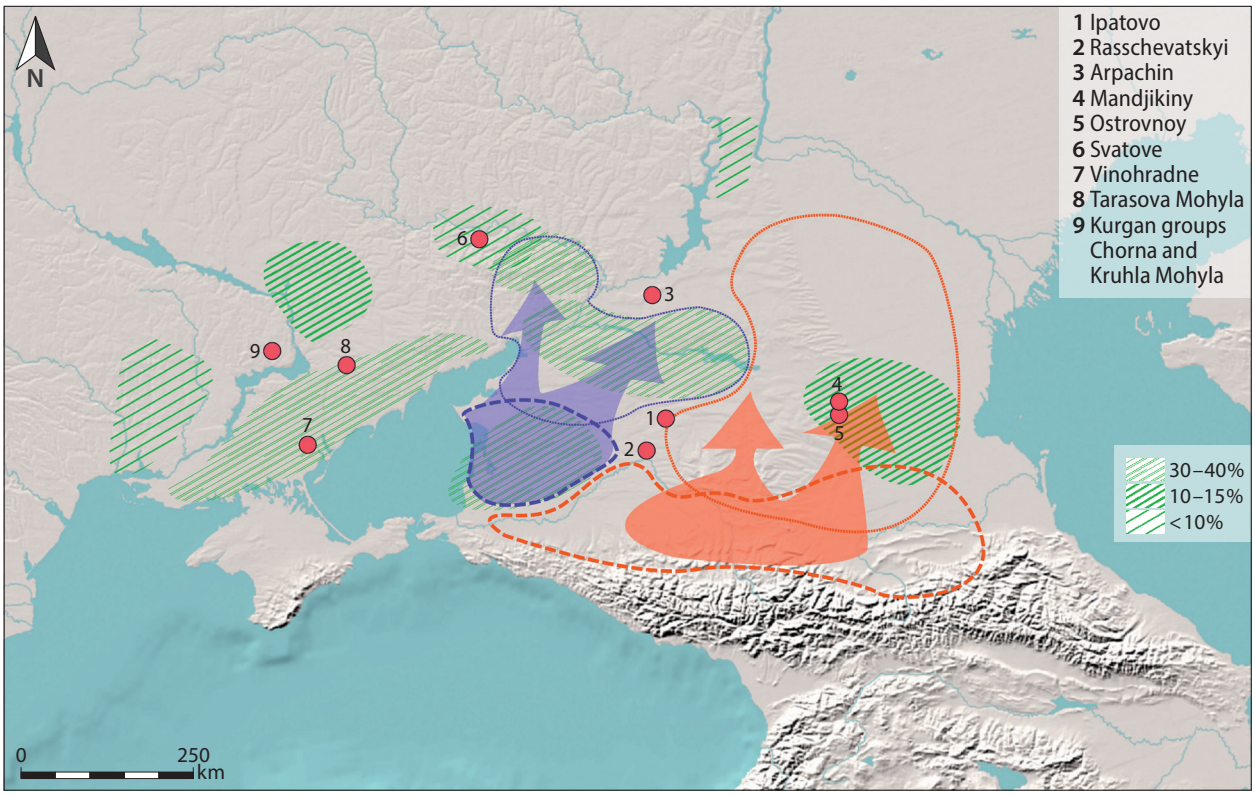

Fig. 1. Distribution map of the Early Catacomb Culture. Blue: western heartland; green: eastern heartland. ***Dotted lines****: the distribution areas of the Novotitarovskaya (****blue****) and the North Caucasian Culture (****orange****);* ***hatched areas****: Early Catacomb graves in burial mounds outside the heartlands. No. 1–9 sites of kurgans discussed in the text (map modified after Stegantseva 2020, 393 fig. 1).*

respective relative chronological classification of these early catacombs was at the centre of attention. Based on this classification, the transition from the Yamnaya to the Catacomb Culture was also discussed as either an autochthonous process or a change in the grave types due to immigration. The early catacombs are characterized by both the lateral burial chamber and the entry shaft being relatively large in comparison to the structures of the advanced phase; the entry shaft is often rectangular, and T-shaped structures (Fig. 2.3–4) are distinguished from those with an entry shaft parallel to the chamber (H-shape). The deceased are usually placed into the burial chamber with slightly bent knees. Viktor A. Trifonov (1991, 150) considered this trait of the early catacombs a transregional phenomenon and therefore suggested the designation 'common Eastern European horizon' of the Catacomb Culture. As for the following phase of the Catacomb Culture, differences in the construction and funerary practices had become apparent on a regional level. Leo S. Klein (1970) stressed the pronounced differences between the regional groups and questioned whether they could really still be assigned to a single culture or needed, rather, to be considered independent ones. In Eastern Europe, spaciously spread complexes with a similar material culture are described by the concept of the 'cultural-historical community.' I will follow the terminology introduced in Eastern Europe and will also speak of cultures regarding the advanced phase of the Catacomb Culture (*e.g.* Inhul or Manych Catacomb Culture).

According to Viktor A. Trifonov, a horizon can therefore be determined before the regional division in which the catacombs show comparable characteristics. In contrast, Veronika Ya. Stegantseva's (2020) investigation across regions also considers the spatial differences in the Early Catacomb Culture. In all areas where secondary burials belonging to the Early Catacomb Culture were dug into already existing burial mounds, these graves followed on the tombs of the preceding cultures and are older than the catacombs of the respective regional Catacomb Culture. According to Veronika Ya. Stegantseva, the heartland of the Early Catacomb Culture distribution area can be divided into two areas in the steppe zone of the Caucasian foothills. Both areas more or less correspond to the distribution areas of the two previous cultures: the Novotitarovskaya Culture in the west and the North Caucasian Culture in the east (Stegantseva 2020, 394) (Fig. 1).

In the western area between the Kuban River and the lower Don River, the early catacombs are T-shaped: a mostly elongated rectangular to slightly trapezium-shaped entry shaft was followed by a rectangular lateral chamber with sometimes strongly rounded corners (Fig. 2.3–4). The floor was covered with an underlay of organic material that left behind whitish, brownish, or blackish discolourations. The deceased lay on their right side with their legs only slightly bent at the hips and knees. Grave goods were rare; metal spiral rings in the area of the head and jewellery of so-called North Caucasian character and the occasional small dagger or awl may have been part of the personal equipment. Vessels were uncommon; instead, the fragment of a large vessel, interpreted as a 'censer', might have lain in the grave (Stegantseva 2020, 394–395).

The eastern group, in contrast, corresponds in its distribution with the area of the North Caucasian Culture (Stegantseva 2020, 395–396). In addition to the T-shaped catacombs, there are also catacombs whose entry shaft is virtually as big as the lateral chamber, and both of them are located parallel to each other — the so-called "H-shape". The entry shaft may also be offset from the chamber, and other shapes are possible. All in all, Veronika Ya. Stegantseva (2020, 395) assumes the eastern group of Early Catacomb Culture should be dated slightly later because the complexes are not as accurately built as in the eastern Azov region. Often the deceased lay stretched out on their back.

Natalya I. Shishlina, who has worked on the Aeneolithic and Early Bronze Age graves in the northwestern Kaspi region — which, according to Stegantseva, belong to the eastern group of Early Catacomb Culture — portrays the burial customs of the first half of the 3rd millennium BCE as being even more varied. Individuals were buried on their back with stretched out legs or with only slightly bent lower extremities, but most of the deceased were buried in a crouched position on their side (Shishlina 2007, 106–121). Underlays of plant material were also often identified, as well as the use of ochre. The modest equipment of the dead with artefacts is also observed for this group. A novelty are the first 'censers' ('kurilnitsa' in Russian), which became a ceramic type form in the Manych Catacomb Culture (Panasyuk 2014).

From her analysis of around 680 graves in the steppe zone of the Caucasian foothills, Veronika Ya. Stegantseva (2020, 401) concluded that the Early Catacomb Culture had succumbed to influences from other — preceding? — cultures in both areas of its heartland: In the area between the lower Don and the Kuban River, elements from the Novotitarovskaya Culture are recognizable among the few grave goods; in the area further east, however, traditions from the North Caucasian Culture are present. In total, she compiled seventeen ^{14}C dates for the Early Catacomb Culture, including only one for the western area (Stegantseva 2020, 400 table).

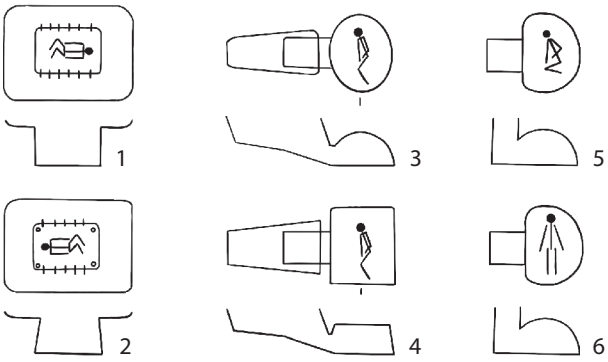

*Fig. 2. Schematic presentation of the various grave constructions: **1–2** rectangular pit graves (Yamnaya Culture); **3–4** T-shaped graves of the Early Catacomb Culture; **5–6** catacomb layout of Catacomb Cultures in the advanced phase (after Trifonov 1991).*

In other regions of the Eastern European steppe, the Early Catacomb Culture constitutes a horizon between the Late Yamnaya Culture and the regional Catacomb Cultures; elements from other partially contemporaneous cultures are not discussed. Stanislav N. Bratchenko (2001) collated around 100 Early Catacomb graves among a total of 1200 catacomb graves in the area along the Siverskyi Donets River. He also included numbers for other Ukrainian regions from the literature, which Veronika Ya. Stegantseva (2020) adopted (Fig. 1). For the Siverskyi Donets area, Bratchenko described similar characteristics as Stegantseva for the western area of the Caucasian foothills: Catacombs were mainly T-shaped, and the deceased lay in a crouched position on their right side. The skeletons or the floor were often coloured with ochre. Other than large wall fragments of vessels, which are also interpreted as receptacles to burn something in, individual vessels were placed into 7 % of the graves (Bratchenko 2001, 71).

Tatyana I. Kopyeva (2021) has presented concrete numbers for the Catacomb Culture(s) in the Crimea. She assigns 11 % of the compiled complexes (805 graves) to the early phase, for which T-shaped graves are characteristic, but there are also other shapes. Overall, Tatyana I. Kopyeva discerns relatively variable burial customs and attributes this to the regional peculiarities in the Crimea and the associated contact zones (Kopyeva 2021, 47–49). She stresses that Early Catacomb graves were built in parallel to those in the burial mounds associated with the Late Yamnaya Culture. Sadly, there are no radiocarbon dates for the Early Catacomb Culture in Crimea.

West of the Dnipro River only few Early Catacombs were built (Kaiser 2003). The further away from the Dnipro, the less frequently they are found in burial mounds. Here, the late Yamnaya graves are often directly followed by the burials of the advanced phase of the Catacomb Culture, *i.e.* Inhul Culture.

Whereas most researchers interpreted the change in the grave structure as a confirmation of Vasilyi A. Gorodtsov's subdivision into two archaeological cultures and thus tried to prove the chronological sequence through stratigraphic observations, deviating opinions were occasionally also expressed. Sergey Zh. Pustovalov (1992; 1994) evaluated the catacomb graves north of the Black Sea as an indication of different ethnic groups organized in a system of social castes. He traced the castes on the basis of the spatial distribution of identical characteristics, particularly in their burial customs. Along and west of the lower Dnieper River, for example, the Inhul Catacomb Culture was thought to have been common; in the east of today's Ukraine, however, the Donetsk Catacomb Culture (or Eastern Catacomb Culture, as Sergey Zh. Pustovalov called it). Between these two, he discerned a difference in the social organization: The most highly developed community had been the Inhul Catacomb Culture, which had been superior to both the Donetsk Catacomb Culture and the allegedly still contemporaneous Late Yamnaya Culture (Pustovalov 1994, 129–133). An important argument for the contemporaneousness of the Late Yamnaya and regional catacomb cultures such as Inhul and Donetsk were the alleged stratigraphic observations in burial mounds that were said to prove that the Yamnaya graves were still dug into the mounds after the construction of the catacombs of the advanced phase of Catacomb Culture. With this re-assessment, Sergey Zh.Pustovalov contradicted his earlier work on the Catacomb Culture, in which he had established an early phase of catacomb graves (Pustovalov 1982). His interpretations concerning the system of social caste have been vehemently opposed (Nikolova and Chernykh 1997).

THE ABSOLUTE DATES OF THE EARLY CATACOMB CULTURE

Despite numerous radiocarbon dates, the absolute chronology of the Eastern European steppe and forest steppe zone can still only be categorized in fairly rough temporal stages. Viktor A. Trifonov (2001) provided an important basis for such stages. In one project, he and his colleagues collected hundreds of ^{14}C dates from mostly Aeneolithic and Bronze Age graves. For the area between the Prut and Dnipro Rivers, there were 223 dates for the period between 3500 and 2000 cal BC — almost half the dates known at the time for the entire Eastern European steppe region including the North Caucasus. Accordingly, there were and still are entire areas with only very few absolute dates. Of the 223 dates in the Prut-Dnipro area, more than 160 are from complexes assigned to the Yamnaya Culture. Even if the quality and number of the data have changed somewhat since then, the picture drawn by Trifonov still tends to hold true. Monuments of certain regions have been significantly more extensively sampled and chronologically evaluated than others.

For the period of interest here, Viktor A. Trifonov proposed the following sequence: From 3000 cal BC, the Yamnaya Culture spread during its advanced phase in the Eastern European steppe region. From around the 28th century cal BC, the Early Catacomb Culture replaced the Yamnaya Culture at least in Southern Russia and Eastern Ukraine. After 2700 cal BC, the grave structures and burial customs associated with the Early Catacomb Culture also spread into other regions. Thereafter, during a timespan Viktor A. Trifonov was unable to define in narrower absolute-chronological boundaries, the early catacombs were gradually replaced by the complexes of the regional Catacomb Cultures of the advanced phase. From 2200 BCE at the latest, the first monuments of the post-Catacomb Culture appeared.

Apart from the fact that, except for Viktor A. Trifonov's contribution (2001), the ^{14}C dates were not further analysed, there are several problems preventing a finer absolute-chronological subdivision of the 3rd millennium BCE. For one thing, as mentioned, many regions are underrepresented in the radiocarbon dating. Furthermore, there was no archaeological information for many of the radiocarbon-dated graves. Often, only selected complexes from a burial mound were sampled and dated, and the reasons for the selection are unknown. Bayesian modelling is therefore only rarely possible, a fact that will be discussed in more detail below. Samples were often taken — as far as indicated in the publications — from timber or human bones. For wooden samples, an 'old wood effect' can therefore not be ruled out, and for the human bones, a reservoir effect has been discussed (Shishlina *et al.* 2012; also see Kaiser 2019, 57–60). Short-lived materials are usually not present in the graves. Differences in the analytics of different laboratories cannot be ruled out either. Many of the analyses were done in the radiocarbon laboratories in Kyiv, St. Petersburg, and Moscow. But when two samples were taken from the same grave — either from the same sample material or different ones — and

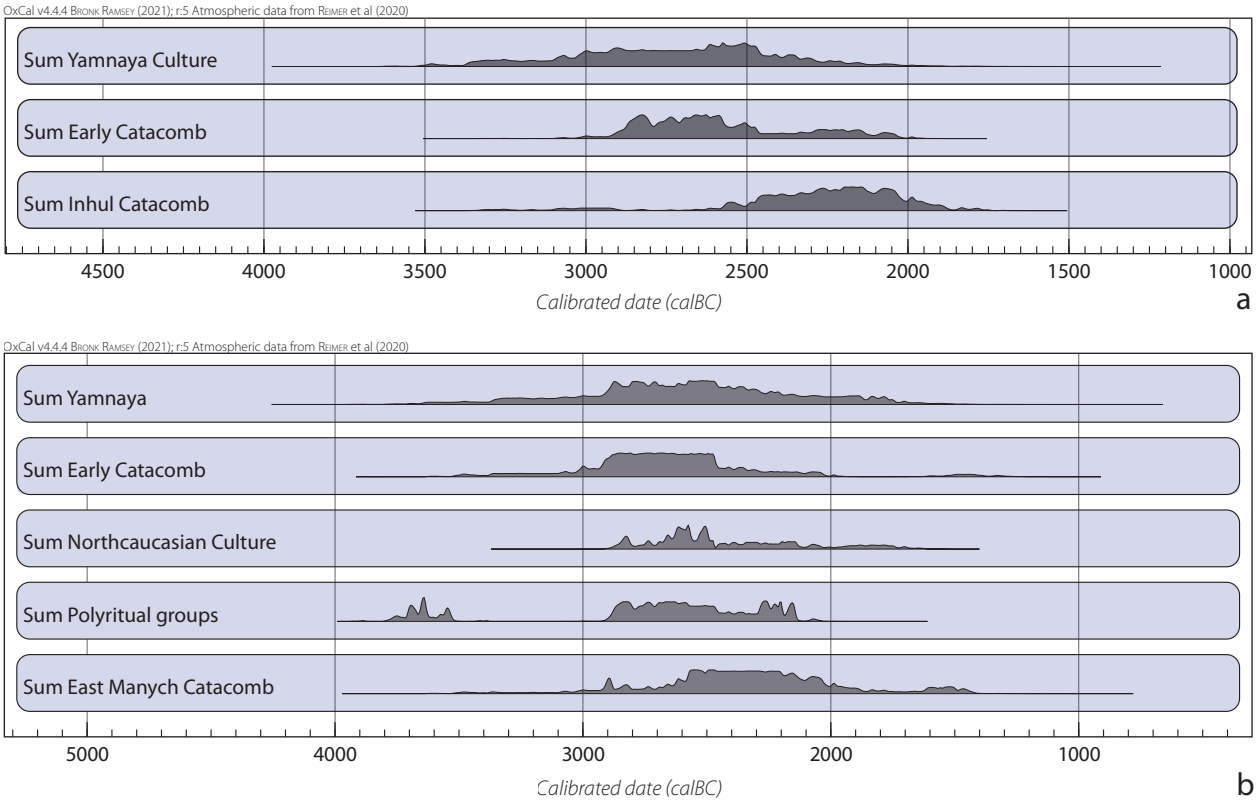

Fig. 3. Sum calibration of the ^{14}C dates published ***a*** *for the area along the lower Dnipro (Data taken from Nikolova 1999a Nikolova 1999b; Kaiser 1999; Telegin* et al. *2003);* ***b*** *for the northwestern Caspian region (Data from Shishlina 2007, appendix 2; Shishlina* et al. *2009; 2012).*

dated in two different laboratories, the resulting radiocarbon dates sometimes deviated from each other.[2] In addition, numerous dates with high standard deviations were presented, which led to very broad time intervals for the already flat areas of the calibration curve in the 3rd millennium BCE (see Table 1).

Two examples illustrate these long overlap areas pretty well when the published ^{14}C dates from the graves of individual archaeological cultures of the 3rd millennium BCE are calibrated summarily (Fig. 3). For the area of the lower Dnipro, a relatively long period in the first half of the 3rd millennium is recognizable; both Yamnaya and Early Catacomb graves date to it (Fig. 3a). The sum calibration for the Inhul Catacomb Culture is distinctly set off despite the aforementioned problems with radiocarbon dating.

The summarily calibrated timespans for the archaeological cultures in the northwestern Caspian region show long overlap areas (Fig. 3b). However, the majority of the calibrated dates of the Early Catacomb Culture clearly lie predominantly in the first half of the 3rd millennium, whereas those of the East Manych Catacomb Culture primarily lie between 2600 and 2000 cal BC. In this region, we also find graves of the Yamnaya Culture and burials assigned to the North Caucasian Culture (Shishlina 2007, 86–105). These are characterized by the stretched supine position of the deceased; individuals are buried in rectangular pits (see Fig. 1).

Graves referred to as polyritual in Figure 3b have a hybrid manifestation; Natalya I. Shishlina (2007, 140) describes them as "characterized by several cultural groups' funeral rites." Their presentation would go too far here, but they were included in the sum calibration because they also belong to the graves in kurgans of the 3rd millennium in the northwestern Caspian region.

Yet despite the generally difficult status of available data, in the sum calibrations the trend in the succession from the Early Catacomb Culture to the regional Catacomb Cultures — Inhul in the Dnipro area, East Manych in the northwestern Kaspi region — is nevertheless clearly recognizable. However, no concrete

2 See Shishlina 2007, 206 table 15–16. However, there were even differences for two samples from the same complexes analysed in the same laboratory, see Telegin *et al.* 2003, 147 table 1, no. 167–169, and 164 table 2, no. 9–10.

periods can yet be described for the individual archaeological cultures, particularly as virtually all published data has been considered. Perhaps some of the summary timespans can be shortened further, for example, by excluding dates with large standard deviations from the calibration.

Nevertheless, it has become clear that, without including archaeological contexts when interpreting radiocarbon dates, the impression might arise that the Yamnaya and the Catacomb Culture were contemporaneous phenomena over a long period of time. Evgenyi N. Chernykh (2008, 44–45) came to this conclusion when he postulated a 600-year coexistence of both cultures and contradicted their traditional chronological separation based on sum calibrations. The observations and results of many excavations of burial mounds, however, contradict this assessment, as already mentioned. The stratigraphic information can be included in Bayesian modelling, which will be done in the next step. Even if the status of the published radiocarbon-dated graves is rather modest, several sequences of absolute dates correlate with layers and phases in burial mounds.

Two burial mounds from the North Caucasus

From the North Caucasian area in the district of Stavropol', large burial mounds are among the excavated sites, and they were used as burial places for a long time. Additional layers of soil were placed above secondary burials so that stratigraphies over several centuries are discernible. One of these burial mounds, the Bolshoi Ipatovskyi kurgan (Great Ipatovo mound; Fig. 1.1), was excavated in 1998 and 1999 by GUP Nasledie of the Ministry of Culture of Stavropol' Krai under the direction of Andrey B. Belinskyi (Korenevskyi *et al.* 2007). With a height of up to 7 m and a diameter of 100–120 m, this burial mound was one of the biggest in this region. Eleven layers were documented and a total of 195 graves were excavated, most of which (151 graves), however, stem from the Turkic-speaking Nogais people and date to the early modern period. 34 graves are assigned to the Maykop Culture and Bronze Age cultures. Three burials are from the Early Iron Age, and another five could not be dated (Korenevskyi *et al.* 2007, 5). There are 41 ^{14}C dates for the Bronze Age graves, including those of the Maykop Culture; 30 of them were determined at the Geological Institute of the Russian Academy of Sciences in Moscow and another eleven at the Centre for Isotope Research at Groningen University.

Sergey N. Korenevskyi *et al.* (2007, 90–97) described the absolute dates of the individual layers of the kurgan and of the concrete features sampled; they also discussed the extent to which archaeological expectations matched the dating. Despite the fact that the calibrated periods of time deviated, sometimes considerably, from previous absolute-chronological hypotheses, the authors deduced that the burial mound had been used more or less continuously from the Early Bronze Age — to which they also counted the Maykop Culture — to the end of the Manych Catacomb Culture and the beginning of the post-Catacomb Culture. But they excluded some of the radiocarbon dates from further consideration. The dates show some of the issues of radiocarbon dating already discussed here: sometimes high standard deviations that are particularly conspicuous for some of the dates from the laboratory in Moscow (in some cases more than ± 200 years BP), and various sample materials that were rarely short-lived or for which a 'reservoir effect' can be assumed (*e.g.* molluscs).

The excavators of the Bolshoi Ipatovskyi kurgan drew their conclusions of a continuous sequence of the graves and the absolute chronological classification of the phases without any statistical methods; their conclusions were solely based on correlating the layers and the ^{14}C dates (Korenevskyi *et al.* 2007, table 5). I have therefore tried to tentatively enter the data into a simple Bayesian model, using the stratigraphic information in Sergey N. Korenevskyi *et al.* (2007, table 2–3). Graves 187 and 195 were referred to as the primary graves and treated in the Bayesian model as an early phase in the development of the kurgan, even though Grave 195 was assigned to the Yamnaya-Maykop Culture and had been dug into the first mound above Grave 187. All other graves are subsequent burials. In some cases, another layer of the burial mound on top of the graves was documented; in others, it was only recorded that they had been dug into a specific layer. This information has been adopted here. The first model yielded a statistical agreement value of only 2.8 %! The radiocarbon dates with very low agreement values — mostly ^{14}C dates whose radiocarbon ages appear to be very young — were removed from the modelling in another step. This resulted in a model with an Amodel value of 88.6 % (Fig. 4). Only the dating for the ritual complex in Layer 7, also assigned to the Early Catacomb Culture, shows an agreement value of only 38.9 %, whereas all other dates in the model have values above 60 %.

If this model is used as a basis, then the early Early Catacomb grave 167, above which mound layer 5 was deposited, shows the oldest calibrated timespan and thus dates to the 28th/27th century cal BC. Grave 168 is the youngest of the five complexes that were assigned to the Early Catacomb Culture and were radiocarbon dated. This grave is also known for the comparatively well-preserved wagon in its burial chamber (Belinskyi and Kalmykov 2004). The two ^{14}C dates available for this grave were integrated with the combine function,

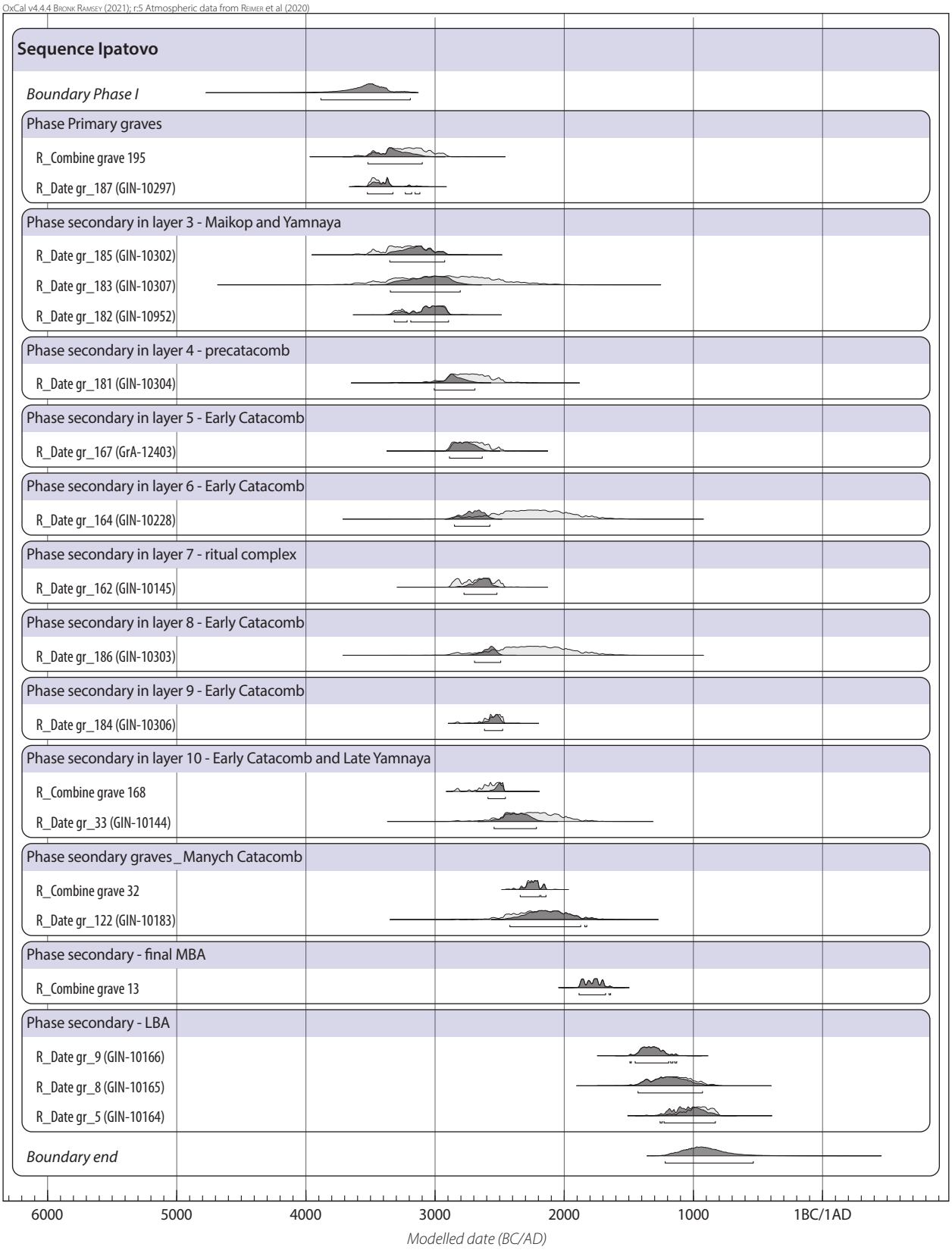

Fig. 4. Bayesian model for the Bolshoi Ipatovskyi kurgan in Stavropol' Krai (stratigraphic information from Korenevskyi et al. *2007).*

yielding a model with a timespan of 2591–2456 cal BC (95,4 % probability, (Fig. 4). This would mean that the Early Catacomb graves in this mound dates to between 2800 and 2450 cal BC.

The relationship to the burials of the Yamnaya Culture remains unclear because the two radiocarbon-dated Yamnaya graves lay far apart, also stratigraphically. Grave 182 was dug into Layer 3; it yielded a timespan of 3298–2892 cal BC (95,4 % probability; Fig. 4). Grave 33 was dug into layer 10 and is therefore younger than the latest Early Catacomb grave 168. In the model, it dates to 2530–2240 cal BC (95,4 % probability), which seems to be very young for the Yamnaya Culture. Wooden beams covered the rectangular burial pit containing two deceased in supine position with bent legs. The few elements of construction and burial custom are characteristic of the Yamnaya Culture (see Table 2).

The authors also used some cultural-chronological attributions specific to this particular part of Russian steppe. Grave 195, for instance, was assigned to the Yamnaya-Maykop Culture; in our model, it dates to 3524–3059 cal BC (95,4 % probability). Grave 181 is referred to as pre-Catacomb. It was in a rectangular pit (Korenevskyi *et al.* 2007, 63–64) and shows the characteristics of this cultural group as described by Viktor A. Trifonov (1991, 123). When he evaluated the burial mounds of the Kuban region, he placed grave 181 between late Yamnaya and Early Catacomb burials. The modelled calibrated timespan of 3007–2692 cal BC (95,4 % probability) is very broad and therefore, in principle, compatible with Trifonov's chronological approach.

The Bayesian model for the burial mound of Ipatovo can now be compared to the recently published model of the graves from Kurgan 21 of Rasshevatskyi-1. The burial mound necropolis is located between the Kuban and Yegorlyk Rivers in Stavropol' Krai (Fig. 1.2). As with the Bolshoi Ipatovskyi kurgan, the excavation of several mounds in this group was carried out by GUP Nasledie. Kurgan 21 was excavated in 2000 under the direction of Vyacheslav L. Rostunov. The results and the further investigations were presented in a joint publication (Kalmykov *et al.* 2022). In their contribution to this volume, Aleksey A. Kalmykov and Sabine Reinhold (2022) comprehensively described the five documented layers in the stratigraphy of the kurgan and discussed them critically. A total of eight radiocarbon dates for graves of the Yamnaya, Novotitarovskaya, North Caucasian, and Early Catacomb Culture are available and were analysed by Bayesian modelling (Kalmykov and Reinhold 2022, 179–181). For two Yamnaya graves, consecutive timespans could be modelled; the younger Grave 11 was thus dated to 2885–2759 cal BC (95,4 % probability, table 2). There was only a slight temporal overlap with grave 21, assigned to the North Caucasian Culture. Both Novotitarovskaya graves date to the 28th–27th centuries cal BCE. The only Early Catacomb grave in this kurgan shows a timespan of 2578–2347 cal BC in the model (95,4 % probability, table 2). It is therefore contemporaneous or slightly younger than grave 168 from the Bolshoi Ipatovskyi kurgan. Aleksey A. Kalmykov and Sabine Reinhold (2022, 180) stress that, thanks to Bayesian modelling, dating intervals due to plateaus of the calibration curve can be compensated. Aleksey A. Kalmykov and Sabine Reinhold (2022, 172–173) also address the overall status of the data for the Caucasian foothills. Thanks to the European Research Council's project BIOARCCAUCASUS, the previously very limited number of radiocarbon dates for the Aeneolithic and Bronze Age cultures in this region were considerably expanded to a total of 577 dates. Additional modelling, including stratigraphic information, can therefore be expected in the near future.

The Arpachinskyi 1 kurgan at the lower Don River

For the area at the lower Don, Bayesian modelling can be carried out for one kurgan; however, only three ^{14}C dates are available (Fig. 5). Kurgan group III is located near the village of Arpachin in Rostov district at the lower Don (Fig. 1.3) — thus north of the two kurgans presented above and beyond the foothills. From the perspective of its cultural chronology, the lower Don area forms the transition to the Siverskyi Donetsk basin and to the northwestern Caspian region bordering to the east, both of which will be discussed later. In the kurgan, excavated by the Yuzhnaya Ekspeditsiya of the Archaeological Institute of the Russian Academy of Sciences in 2013, seven graves were documented (Gei and Kleshchenko 2015). The first kurgan was erected above Yamnaya Grave 4, into which Grave 3 was dug, a typical T-shaped catacomb. On top of it, another layer of the kurgan was placed, into which burials of the Early and Manych Catacomb Cultures were dug. For the modelling, the stratigraphic information for the two older phases was therefore considered, and the phase 'West Manych Catacomb' was modelled on the basis of the relative-chronological archaeological distinction. The three calibrated time spans clearly differ from each other (Fig. 5); however, this was to be expected in view of the three bp dates. Again, the dates modelled for the Early Catacomb grave are of particular interest. The timespan of 2891–2632 cal BC (95,4 % probability) is clearly distinct from the dating of Grave 6, which was assigned to the Western Manych Catacomb Culture and was dated to the 25th to 23rd century cal BC.

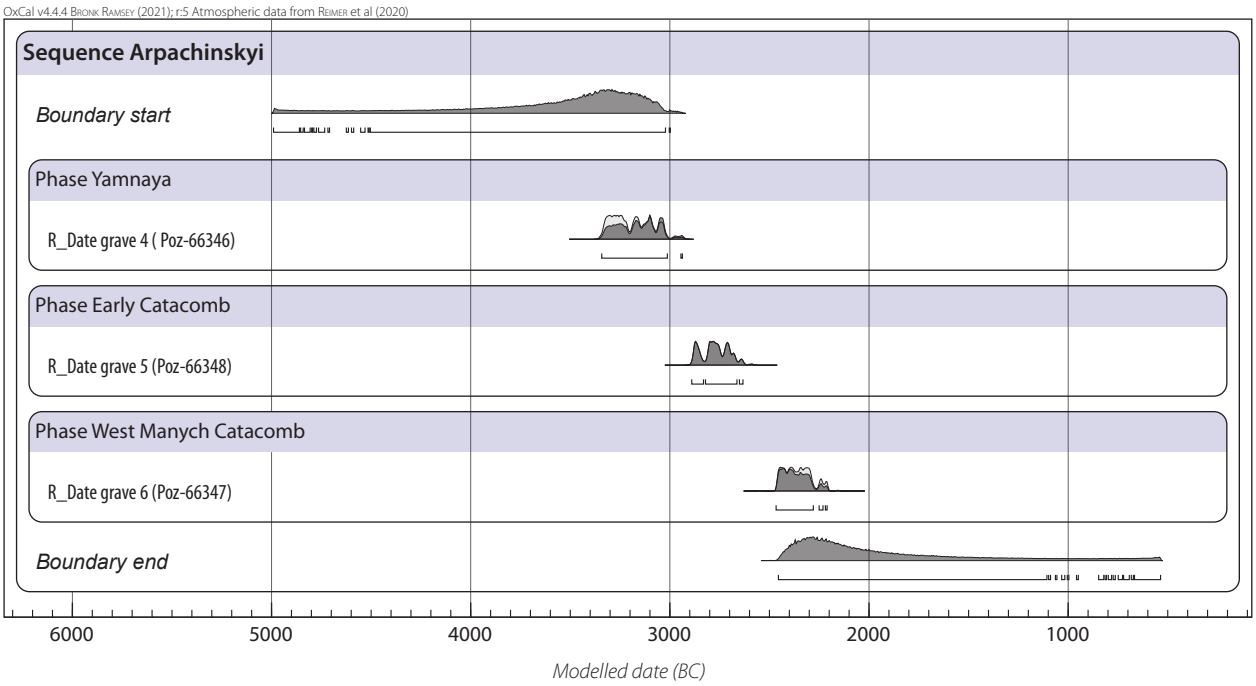

Fig. 5. Bayesian model for kurgan 1 in kurgan group III near the village of Arpachin in Rostov district at the lower Don River (^{14}C dates and stratigraphic information from Gei and Kleshchenko 2015).

Radiocarbon dates for kurgans in the northwestern Caspian region

In her groundbreaking study, Natalya I. Shishlina (2007) reappraised the Early and Middle Bronze Age in the northwestern Caspian region (Republic of Kalmykia). As mentioned above, her results show that the Maykop Culture in this region was followed by graves that differ in their construction and burial rites and were therefore assigned to different archaeological cultures. In addition, and likewise mentioned above, Shishlina has also published an extensive series of ^{14}C dates for individual cultures. But owing to data-related issues, Natalya I. Shishlina (2007, 213 fig. 139) was only able to conduct a comparatively schematic absolute-chronological classification. This was also due to the fact that, despite the many radiocarbon dates that have been published for the steppes in Kalmykia, only very few of them are linked to well-stratified kurgans.

Although only a few kurgans with several layers are known, Natalya I. Shishlina (2007, 192–201) has compiled Harris matrices for more complex layer sequences in burial mounds. This information allows for a Bayesian modelling of Kurgan 14 from Mandjikiny, Group I (Fig. 1.4 and Fig. 6), even though the kurgan itself has not yet been published (Shishlina 2007, 195 fig. 134.6). The papers by Natalya I. Shishlina *et al.* (2009; 2012) contain the ^{14}C dates and the cultural-chronological assignment of the graves.

A total of nine dates are available for five graves. In an initial model, the two ^{14}C dates from Grave 13 of the Maykop Culture were tentatively combined using OxCal, but the chi-square test failed. Both dates were therefore entered into the model as individual values. For Yamnaya grave 12, two divergent dates have been published, but the very young radiocarbon age of 3770 ± 60 BP (IGAN-3228) can be brought in line with neither the sequence of layers nor the second date by the Institute of Geography, Russian Academy of Sciences, Moscow. It was therefore disregarded, and only the second ^{14}C date of 4033 ± 76 BP (IGAN-2492) was considered. In her Harris matrix, Natalya I. Shishlina identifies two consecutive graves of the Yamnaya Culture. Grave 10 was therefore assumed to correspond to the older phase and Grave 12 to the younger phase. Accordingly, two phases were modelled for the use by the Yamnaya Culture, which, of course, must be subject to the results of the final publication. The two dates of the Manych Catacomb Culture were combined. The present model has an agreement value of 103.4 % (Fig. 6). Both Yamnaya graves now fall into two consecutive time periods, the older starting around 3335 cal BC and both overlapping only shortly around 2874 cal BC. The early Catacomb Grave 6 was built between 2749 and 2351 cal BC (95,4 % probability). The two ^{14}C dates for Manych Catacomb grave 1 fall into the interval of 2562–2146 cal BC (95,4 % probability) when combined; they therefore overlap for approximately 150 years with the previous phase.

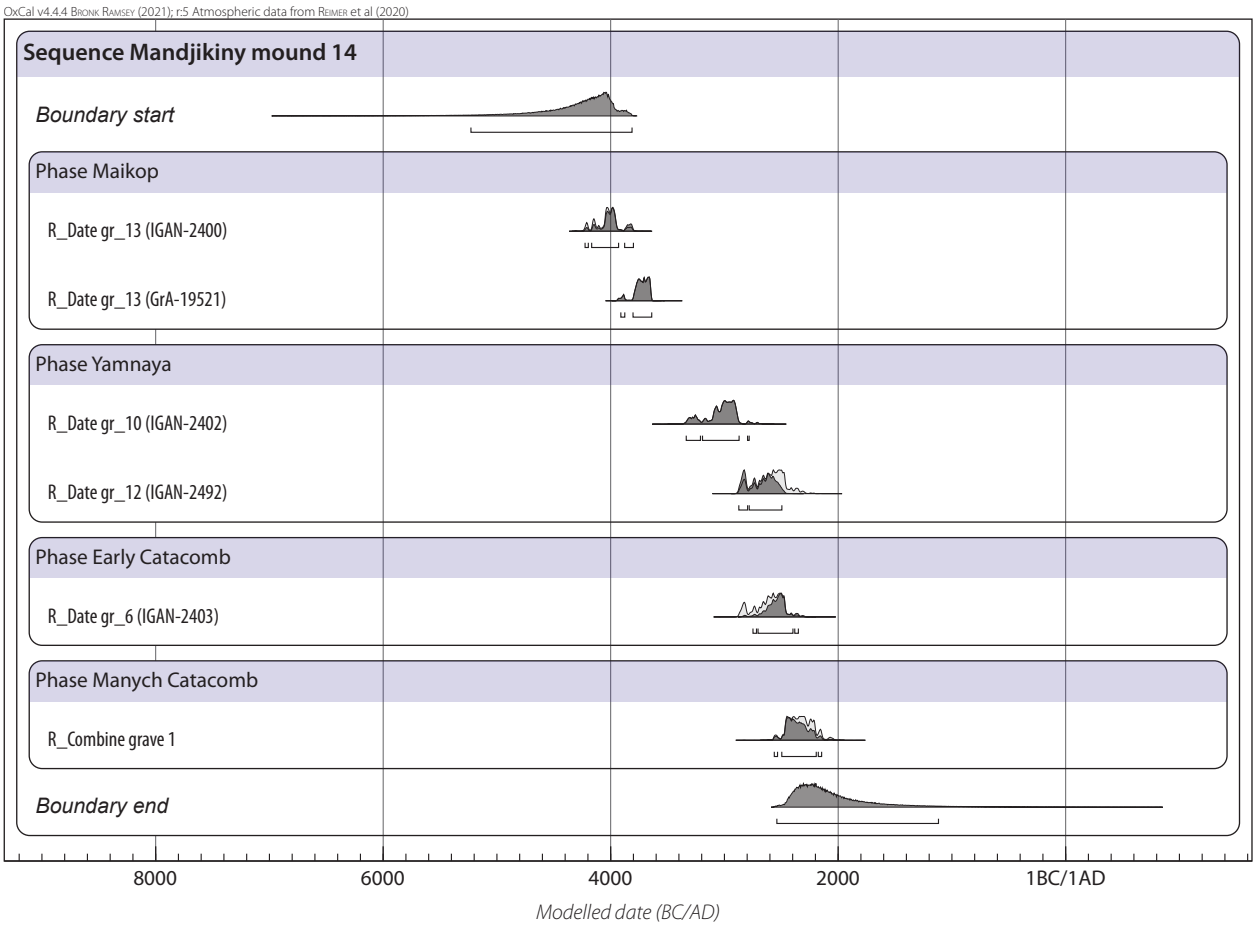

Fig. 6. Bayesian model for kurgan 14 of kurgan group I of Mandjikiny in the northwestern Kaspi region (^{14}C dates and stratigraphic information from Shishlina et al. *2009; 2012).*

Another grave sequence with available radiocarbon dates is known from Kurgan 3 of the group at Ostrovnoy in the Kuma-Manych Depression (Fig. 1.5). Here, the State Historical Museum, Moscow, excavated several kurgans in 2000 under the direction of Natalya I. Shishlina. Kurgan 3 was an elongated mound with a maximum height of 1.78 m. A total of 40 graves were uncovered, most of them dating to the Bronze Age. Shishlina described seven phases of mound development, but they are not always discernible by clear layers. Several graves had been partially destroyed by subsequent graves (Shishlina and Tsutskin 2002, 28–30). Graves 33 and 34 were the oldest ones and were assigned to the Yamnaya Culture. In the second phase, several Early Catacomb graves (26, 29, 36) had been built. Some of them are also very poorly preserved. The excavators assigned Grave 27 to the pre-Caucasian Catacomb Culture; whether this equates with the pre-Catacomb Culture, to which a grave from the Bolshoi Ipatovskyi kurgan was assigned, remains an open question. Several East Manych Catacomb graves and additional burials from younger periods followed.

The total of six radiocarbon dates available for Kurgan 3 of Ostrovnoy are, however, not suitable for Bayesian modelling (Table 1): The dating of Yamnaya grave 33 appears to be too young; the radiocarbon age of the second Yamnaya grave 34 is completely out of place with a date of 6330–400 bp (IGAN-2105). The Early Catacomb graves have not been radiocarbon-dated, and two dates for post-Catacomb grave 39 do not match. In comparison with the other dates, only the ^{14}C dates of the Manych Catacomb graves seem to be consistent.

The kurgan group Svatove in the Siverskyi Donets region

Outside the heartlands in the steppes between the Sea of Azov and the Caspian Sea, graves of the Early Catacomb Culture were also recorded in other areas, for example, along the Siverskyi Donets, which flows into the lower Don (see Fig. 1). Stanislav N. Bratchenko (2001, 6–19) identified around 100 graves of the Early Catacomb Culture by characteristics typical of the Southern

Table 1. Radiocarbon dates for Kurgan 3 of Ostrovnoy, Kalmykia (Data published by Shishlina et al. *2009).*

Grave no.	**34**	**33**	**10**	**38**	**39**	**39**
Arch. attribution	Yamnaya	Yamnaya	East Manych Catacomb	East Manych Catacomb	Post Catacomb (Lola)	Post Catacomb (Lola)
BP date	6330 ± 400	3620 ± 260	3977 ± 67	3743 ± 67	3740 ± 35	4824 ± 66
Lab. no.	IGAN-2105	IGAN-2106	IGAN-2130	IGAN-3115	GrA-32895	IGAN-3234

Russian steppe region. Catacombs in T-shape predominate, with deceased in mostly slightly crouched position. ^{14}C dates are only occasionally available for these early catacombs in the Siverskyi Donets region. Bayesian modelling is impossible due to the low number of such dates as well as to the lack of stratigraphies and publications of the excavation results.

Svatove in the district of Luhansk is the only burial mound necropolis known so far for which a larger number of radiocarbon dates are available and excavation results have been published (Bratchenko 2003; 2004) (Fig. 1.6). Based on the dates' sum calibration, the problems regarding the relative and absolute chronology of the Catacomb Culture in Eastern Ukraine can be briefly outlined. Figure 7 only considers new dates from the laboratory in Kyiv and the ^{14}C dates from the Institute of Geology and Mineralogy, Novosibirsk — a total of 20 dates (Bratchenko 2003, 187 table 2; Telegin *et al.* 2003, 164 table 2).[3] Bayesian modelling was impossible because the radiocarbon-dated graves were from different kurgans, which is also due to the fact that large kurgans with several layers are rare in this region.

Judging from the summary calibration of the three available radiocarbon dates, the graves of the Yamnaya Culture were erected in the timespan of 2850–2550 cal BC (Fig. 7). No graves of the Early Catacomb Culture were identified in the necropolis of Svatove. Bratchenko (2004) assigned a large number of burials to the regional Donetsk Catacomb Culture, for which smaller constructions are characteristic. Using grave goods — mainly pottery shapes and their decoration — Stanislav N. Bratchenko (1976; 2004) divided the Donetsk Catacomb Culture into an earlier and a later phase. According to his division, thirteen ^{14}C dates from graves of the early phase of the Donetsk Catacomb Culture were summarily calibrated; the time interval predominantly falls into the first half of the 3rd millennium BCE (Fig. 7). Except for the 25th and 26th centuries cal BC, these graves, which should chronologically follow the Early Catacomb and Yamnaya Cultures, were contemporaneous with the latter. Four ^{14}C dates from burials of the late phase of the Donetsk Catacomb Culture were summarily calibrated; they yielded a long interval, which, however, lasts up into the second half of the 3rd millennium cal BC.

The result in Figure 7 once again underlines the necessity of including stratigraphic information in a statistical model in order to counter the influences of plateaus in the calibration curve and comparably high standard deviations. Potential sequences of archaeological cultures are thus also visible in the absolute data. Currently, no concrete conclusions can be drawn regarding the sequence of the Yamnaya culture and the two phases of Donetsk Catacomb Culture.

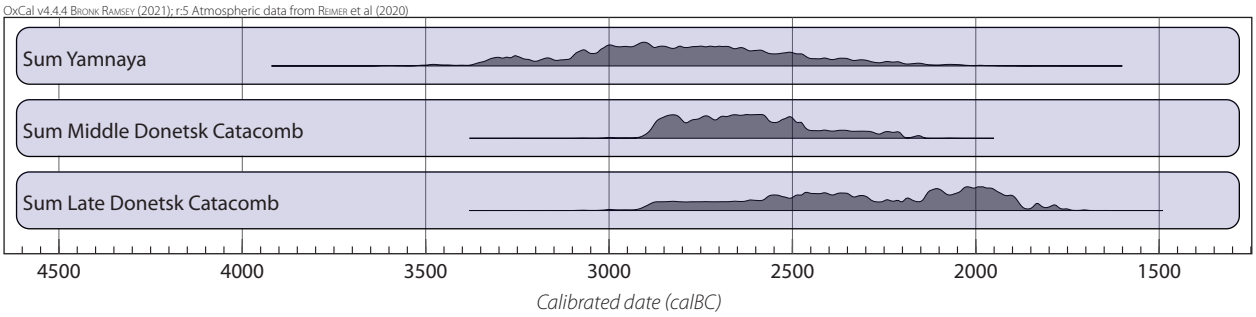

Fig. 7. Sum calibration of the ^{14}C dates for burials of the Yamnaya Culture and the two phases of the Donetsk Catacomb Culture in the kurgan of Svatove, district of Luhansk (Data from Bratchenko 2003, 187 table 2; Telegin et al. *2003, 164 table 2).*

3 On the discussion of the older dates, see Bratchenko 2003, 186.

Dnipro area

In the kurgans east of the lower Dnipro, Early Catacomb graves have been excavated but have often only been described in brief preliminary reports; this includes the kurgans at the Molochnaya River south of the city of Zaporizhzhya (Fig. 1.7). Here, archaeologists from Kyiv have conducted numerous excavations, but hardly any have been published. For Kurgan 24 of the Vinohradne group, the radiocarbon laboratory in Berlin carried out a series of ^{14}C analyses. The results were evaluated with one of the first, if not the first, Bayesian modelling for Eastern European kurgan sequences (Görsdorf *et al.* 2004). When excavator Yuryi Ya. Rassamakin documented the stratigraphic sequence of the Aeneolithic and Bronze Age graves, he ascertained that some of the Late Yamnaya and Early Catacomb graves were built during the same phases of the kurgan. The Bayesian modelling — though already reproduced several times on the basis of Jochen Görsdorf *et al.* (2004) — is shown once again here (Fig. 8; Kaiser 2019, 55–56).

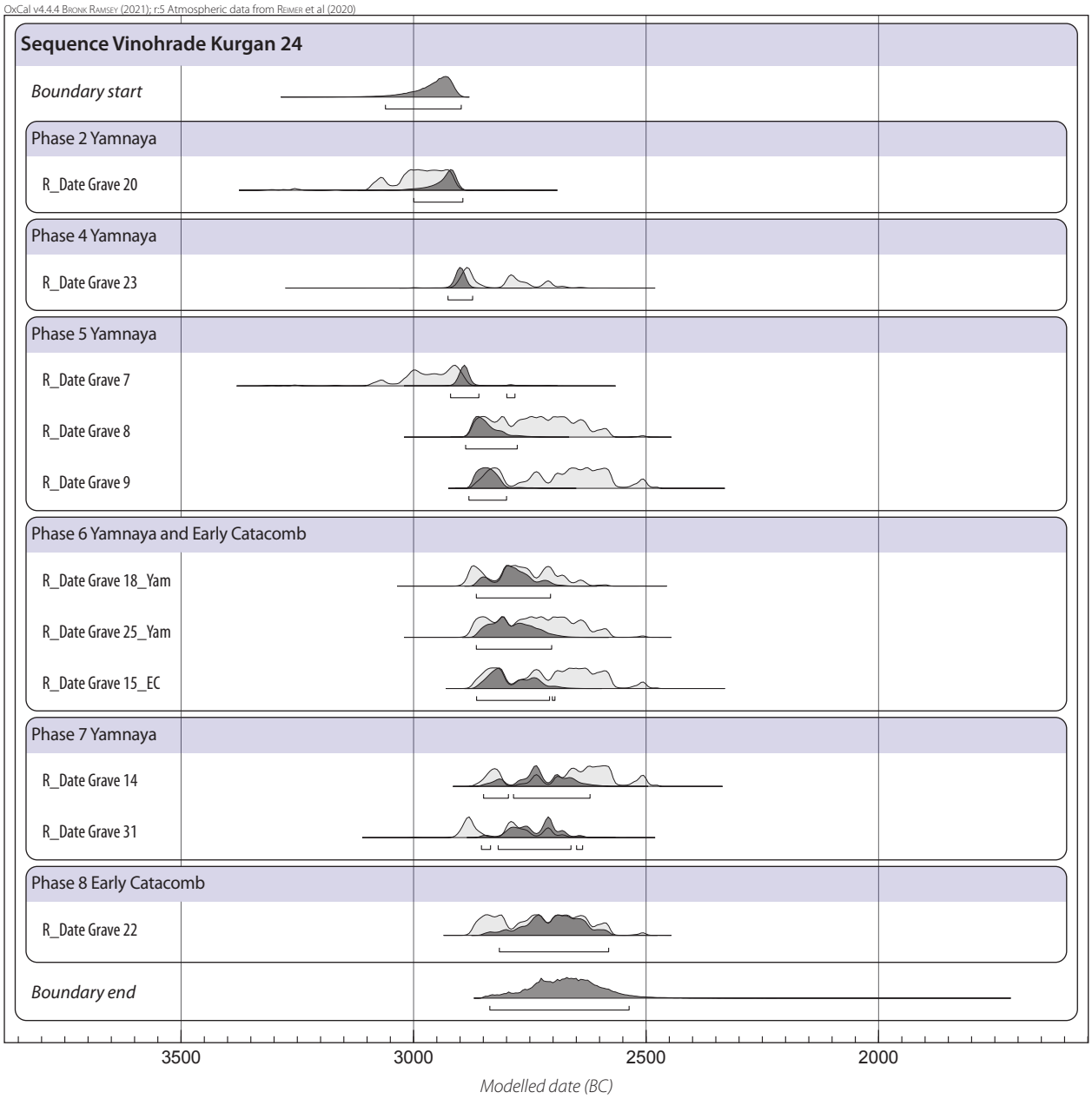

Fig. 8. Bayesian model for kurgan 24 of the necropolis at the village of Vinohradne, district of Zaporizhzhia (Data from Görsdorf et al. *2004, 130 table 1).*

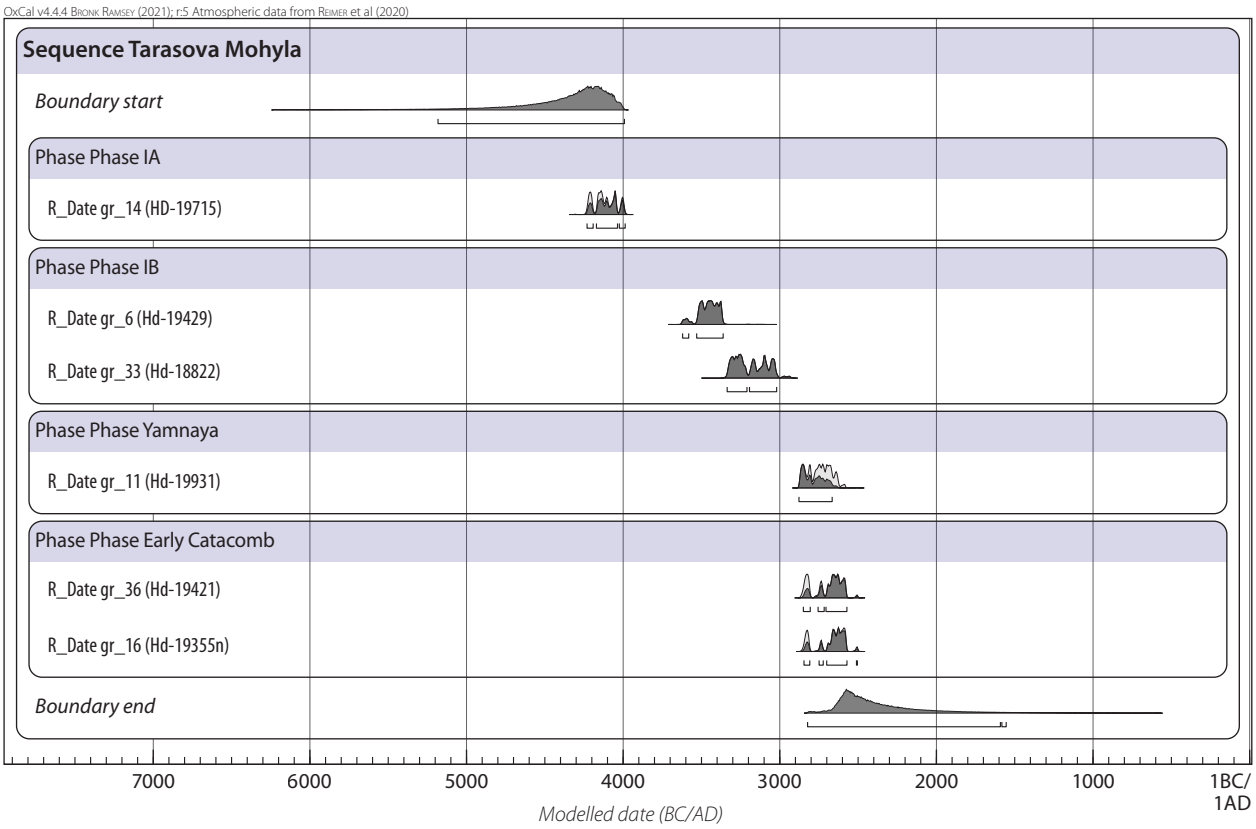

Fig. 9. Bayesian model for Tarasova Mohyla kurgan, district of Zaporizhzhia (Data from Govedarica et al. *2006, 84 table 1).*

The model has an agreement value of over 60 %. All calibrated intervals lie in the first half of the 3rd millennium cal BC. Both grave designs were therefore used contemporaneously between 2860 and 2600 cal BC, at least in this area. Sadly, no graves of the advanced phase of Catacomb Culture from this kurgan have yet been dated in absolute numbers. From other burial mounds of this necropolis, Dmytryi Ya. Telegin *et al.* (2003, 164 table 2) have published numerous ^{14}C dates for regional Catacomb Cultures in this area; after being calibrated individually, they mainly fall into the time after 2500 cal BC.

In 1996, Valeryi A. Samar excavated the kurgan Tarasova Mohyla near the city of Orikhiv (Fig. 1.8). Human bones from six graves were sampled and analysed in the Central Radiocarbon Laboratory in Heidelberg. Three of the graves are Aeneolithic, one was assigned to the Yamnaya Culture, and two others to the Early Catacomb Culture (Govedarica *et al.* 2006). Even though no absolute dates are available for the graves of the advanced Catacomb Culture in this kurgan, a Bayesian model, incorporating stratigraphic information, was created for the six dates. The model has an agreement value of 101 %. Using this method, the construction of Yamnaya grave 11 can be narrowed to the time period of 2878–2666 cal BC. The two Early Catacomb graves date to 2850–2575 cal BC and 2846–2506 cal BC (95,4 % probabilit; Fig. 9); they were dug into the last added layer of soil. Whether Yamnaya grave 11 had already been dug into kurgan layer 2 could not be determined during the excavation.

When comparing the results for these two kurgans east of the Dnipro, they seem to indicate that both rectangular pits and catacombs were used for burials during the 28th to the 26th century cal BC (see Table 2). And, in principle, the timespans presented for the two kurgans and modelled using Bayesian statistics are comparable to the absolute dates Viktor A. Trifonov (2001) proposed for the Early Catacomb Culture.

However, this does not hold true for the data published on kurgans west of the Dnipro near the city of Nikopol (Fig. 1.9), which has already been discussed repeatedly (Nikolova 1999a; 1999b; Kaiser 1999). In these burial mound necropolises, a few graves were also uncovered that have been assigned to the Early Catacomb Culture. Distinguishing them from the catacombs of the Inhul Culture is easy because the deceased were buried in a stretched out supine position in this regional group of the advanced phase of the Catacomb Culture. In addition, a direct stratigraphic position was recorded in Kurgan 7 of the Chorna Mohyla group: Here, Grave 27 of the Inhul Culture cut the vault of the

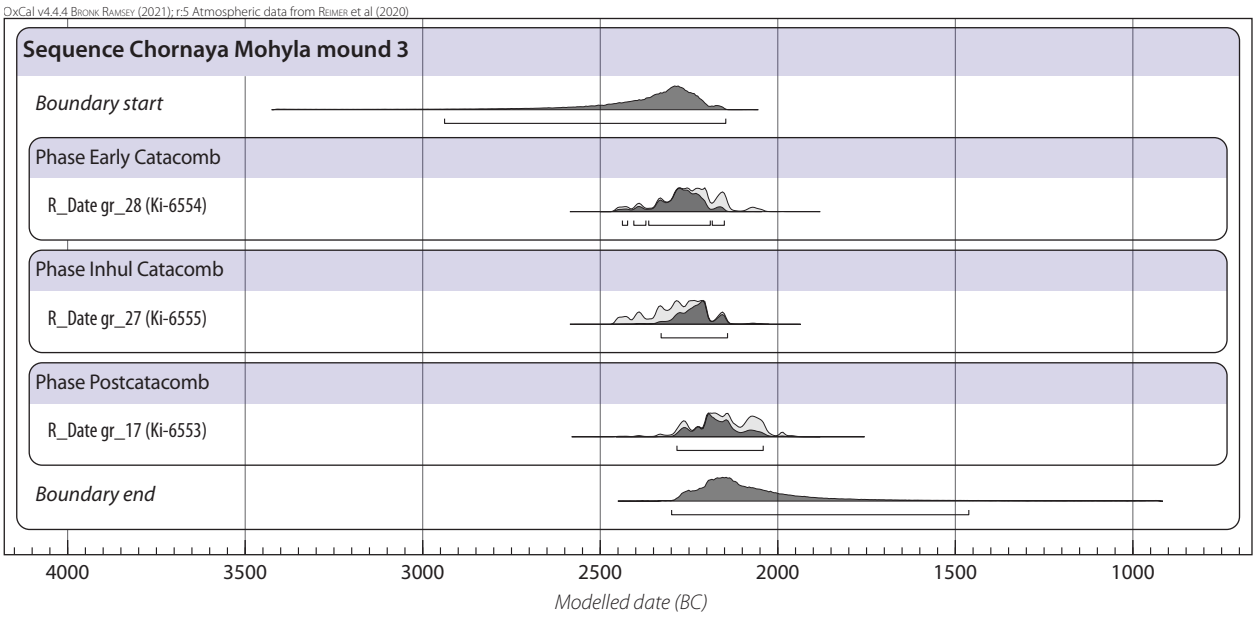

Fig. 10. Bayesian model for kurgan 3 of the Chorna Mohyla group, district of Nikopol (Data from Kaiser 1999).

early Catacomb 28. A radiocarbon date is also available for Grave 17 of the post-Catacomb Culture. The three dates were evaluated with a Bayesian model, assigning them to one of three phases each. The model had a high agreement value of 118 %, but the calibrated period for the Early Catacomb grave of 2436–2152 cal BC (95,4 % probability) is very young compared to the previously assumed timespans. It hardly differs from that of Grave 27 (Fig. 10).

A similar picture is produced using the Bayesian modelling of the radiocarbon dates for Early Catacomb grave 12 and the Inhul Catacomb graves 7 and 17 from Kurgan 11 of the Kruhla Mohyla group. This group of kurgans is located not far from that of Chorna Mohyla. The calibrated periods don't yield significant differences in the Bayesian model here, either: They all fall into the time after 2500 cal BC (Fig. 11). Considering the comparatively young ^{14}C dates of the graves, this result was not surprising. The dating of Grave 12, however, does not match because it is a typical T-shaped catacomb.

Alla V. Nikolova (1999a; 1999b) has spoken out in favour of excluding many of the dates that the radiocarbon laboratory in Kyiv has analysed and that do not match the archaeological expectations. This, however, would be tantamount to disregarding a large number of radiocarbon dates available for monuments in Ukraine.

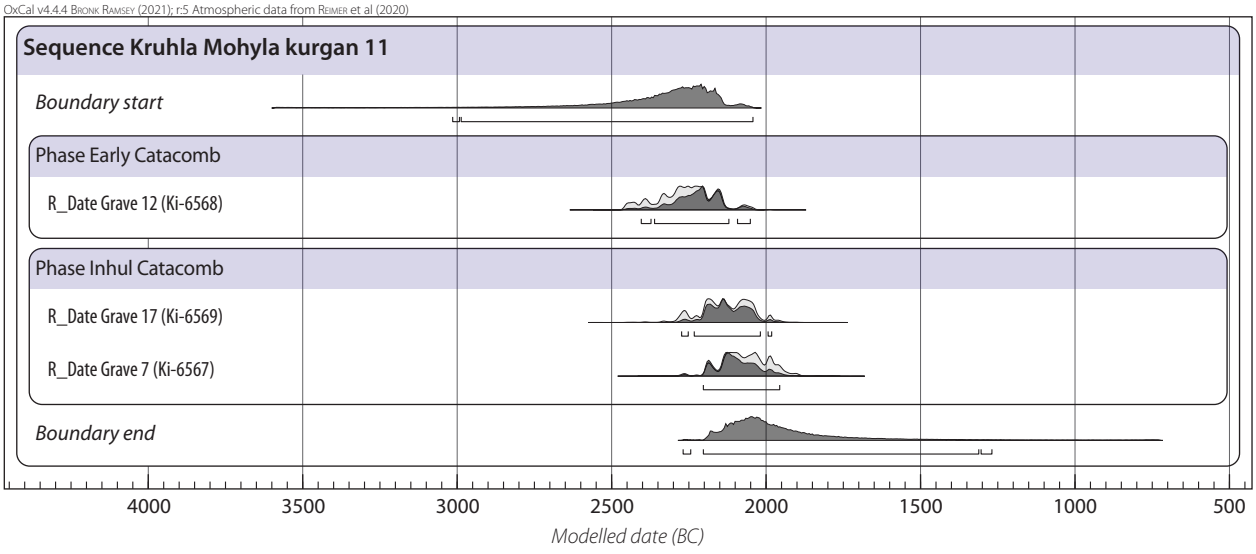

Fig. 11. Bayesian model for kurgan 3 of the Kruhla Mohyla group, district of Nikopol (Data from Kaiser 1999).

DISCUSSION

The radiocarbon dates evaluated here in connection with their kurgan contexts show that a precise absolute chronology for the Bronze Age is still a research desideratum. The Bayesian modelling of dates for which stratigraphic information is also available is a fruitful methodological approach that has yielded initial results at least for the Southern Russian graves. These are once again summarized in table 2, where several dates are available for an archaeological culture, the oldest and youngest calibration intervals are given.

For the graves of the Early Catacomb Culture, a time interval is yielded that is consistent between the eastern bank of the Dnipro and the northwestern Kaspi region; it begins around 2800 cal BC — maybe even a little earlier — and ends around 2500 cal BC. Only the most recently discussed dates for the kurgan groups west of the Dnipro yielded significantly younger calibrated periods. They should no longer be considered in the discussion because they are not compatible with the results for the areas to the east.[4]

In some cases, the Bayesian modelling also shows that Early Catacomb graves were built in the kurgans between the Dnipro and the northwestern Kaspi region over several generations. From 2800 cal BC, they were apparently also built in the mounds parallel to Yamnaya graves (Table 2). At the same time, an early phase of the Yamnaya Culture becomes apparent at least in Southern Russia, starting well before 3000 cal BC. This has also already been pointed out using absolute dates for kurgans between the Dnipro and Transylvania (Diaconescu 2015). Dragoș Diaconescu has distinguished a total of three phases of the Yamnaya Culture. For pragmatic reasons, only two phases shall be considered here, with their peak at 3000 cal BC.

Table 2. Supraregional comparison of the calibrated timespans with 95,4 % probability of Bayesian modelling.

	Stavropol' region		Lower Don region	Northwestern Caspian region	East of lower Dnipro		West of lower Dnipro
	Ipatovo	Rasshevatskyi	(Arpachinskyi)	(Mandjikiny)			(Chorna Mohyla)
Regional Catacomb Culture	Grave 32: 2341–2142		Grave 6: 2467–2211	Grave 1: 2562–2146	Vinohradne	Tarasova	Grave 27: 2329–2142
Early Catacomb Culture	Ipatovo 168: 2591–2456 167: 2889–2635	Grave 8: 2578–2347	Grave 5: 2891–2632	Grave 6: 2749–2351	Grave 22: 2816–2581 Grave 15: 2865–2697	Grave 16: 2850–2506	Grave 28: 2438–2151
Yamnaya (late phase)	Grave 33: 2544–2216	Grave 11: 2885–2759		Grave 12: 2874–2496	Grave 14: 2850–2621 Grave 20: 3000–2895	Grave 11: 2878–2666	
Yamnaya (early phase)	Grave 182: 3316–2896	Grave 13: 3324–3015	Grave 4: 3341–2939	Grave 10: 3335–2873			

Thus, whereas Yamnaya and Early Catacomb graves were built contemporaneously in the first half of the 3rd millennium, the transition to each of the regional Catacomb Cultures seems to have happened relatively quickly. The modelling only shows short overlap areas. This can only be understood on the basis of the Southern Russian kurgan sequences; there are no absolute dates for the others (Table 2).

4 The reasons for the deviating radiocarbon ages of these kurgans, which are too young in comparison, must remain an open question. A systematic error in the dates from the Kyiv laboratory can be ruled out because, as was shown for Svatove in Eastern Ukraine, the dates from Kyiv appear to be too old by a few centuries for the Donetsk Catacomb Culture. In addition, some of the dates for Svatove have been confirmed by another laboratory. New dating programmes are necessary in order to investigate the absolute chronology in this region. There have already been tentative approaches in this respect for Western Ukraine (Goslar *et al.* 2015).

Despite the many published problems with the radiocarbon dates available so far for Bronze Age burials in western Eurasian burial mounds, an attempt was made to reconstruct the absolute chronology of the Early Catacomb Culture. The results indicate a period between 2800 and 2500 cal BC. But can these graves be interpreted more extensively? The possible regional differences, as described by Veronika Ya. Stegantseva (2020), can likely be explained by different traditions or 'communities of practice' (Furholt 2020) in the funerary context. Interpretations beyond this are difficult because the entire cultural-historical assessment of the 3rd millennium BCE in the steppe region is largely based on burials in kurgans, since they are the only archaeological source in many areas. As is generally known, a former lifeworld is only partially manifested in this source; moreover, the source bears the imprint of religious-ritual ideas. Depending on how strongly the burial customs were standardized by the respective 'community of practice,' this is manifest in the archaeological record in the form of easily classified characteristics. The many classifications published for individual regions of Eastern Europe lead to the assumption that the standardizations were not too strictly adhered to. This supposition allows for a certain variability in the grave design and the burial customs, such as the way in which the deceased were placed in their graves, *etc.* But differences such as whether a rectangular burial pit or a catacomb with a lateral entry shaft was built can hardly be understood as a variation in the burial practices. The archaeological attribution to the Yamnaya or the Early Catacomb Culture is based on these very distinctions. Here, the respective 'community of practice' adhered to a norm that certainly also needs to be understood as an expression of social identity.

REFERENCES

Belinskij, A.B. and Kalmykov, A.A., 2004. Neue Wagenfunde aus Gräbern der Katakombengrab-Kultur im Steppengebiet des zentralen Vorkaukasus. *In:* S. Burmeister and M. Fansa, eds. *Rad und Wagen. Der Ursprung einer Innovation. Wagen im Vorderen Orient und Europa*, Beiheft Archäologische Mitteilungen aus Nordwestdeutschland 40. Mainz: Philipp von Zabern, 201–220.

Bratchenko, St.N., 1976. *Nizhnee Podon'e v epokhu Srednei Bronzy*. Kiew: Naukova Dumka.

Bratchenko, St.N., 2001. *Donetska katakombna kultura rannoho etapu*. Luhansk: Shlyakh.

Bratchenko, St.N., 2003. Radiocarbon Chronology of the Early Bronze Age of the Middle Don, Svatove, Luhansk Region. *Baltic-Pontic Studies* 12, 185–208.

Bratchenko, St.N., 2004. Pravdanya Slobozhanshchyna: Svyativski mogyly-kurgany III tys. do n. e. ta maidany. *Materialy ta doslidzhennya z arkheologiï Skhidnoï Ukraïny* 2, 65–190.

Bratchenko, St.N. and Shaposhnikova, O.G., 1985. Katakombnaya kulturno-istoricheskaya obshchnost. *In:* S.St. Berezanskaya, Yu.G. Kolosov, V.A. Kruts, V.V. Otroshchenko, D.Ya. Telegin and N.N. Cherednichenko, eds. *Arkheologiya Ukrainskoi SSR 1. Pervobytnaya arkheologiya*. Kiew: Naukova dumka, 403–420.

Bunjatjan, K.P., Kaiser, E. and Nikolova, A.V., 2006. *Bronzezeitliche Bestattungen aus dem unteren Dneprgebiet*, Schriften des Zentrums für Archäologie und Kulturgeschichte des Schwarzmeeraums 8. Langenweißbach: Beier & Beran.

Chernykh, E.N., 2008. Formation of the Eurasian 'Steppe Belt' of Stockbreeding Cultures: viewed through the Prism of Archaeometallurgy and Radiocarbon Dating. *Archaeology Ethnology & Anthropology of Eurasia* 35(3), 36–53.

Diaconescu, D., 2015. Step by Steppe: Yamnaya culture in Transylvania. *Praehistorische Zeitschrift* 95(1), 17–47.

Furholt, M., 2020. Social Worlds and Communities of Practice: a polythetic culture model for 3rd millennium BC Europe in the light of current migration debates. *Préhistoires méditerranéennes* 8. https://doi.org/10.4000/pm.2383

Gei, A.N. and Kleshchenko, A.A., 2015. Issledovaniya kurgannogo mogilnika Arpachinskyi III na Nizhnem Donu. *Kratkie soobshcheniya Instituta Arkheologiya* 239, 224–239.

Görsdorf, J., Häusler, A. and Rassamakin, Y., 2004. ^{14}C Dating of Mound 24 of the Kurgan Group near Vinogradnoe Village, Ukraine. *In:* T. Higham, Ch. Bronk Ramsey and C. Owen, eds. *Radiocarbon and Archaeology. 4th internat. Symp. St. Catherine's College, Oxford 9–14 April 2002*, Oxford University School of Archaeology Monographs 62. Oxford: Oxford Press, 127–134.

Gorodtsov, V.A., 1907. Rezultaty arkheologicheskikh izsledovnyi v Bakhmutskom uezde Ekaterinoslavskoi guberniy 1903 goda. *Trudy XIII arkheologicheskogo sezda v Ekaterinoslave* 1905(1), 211–365.

Goslar, T., Klochko, V.I., Kośko, A. and Włodarczak, P., 2015. Chronometry of Late Eneolithic and 'Early Bronze' Cultures in the Middle Dniester Area: Investigations of the Yampil Barrow Complex. *Baltic-Pontic Studies* 20, 256–291. https://doi.org/10.1515/bps-2017-0006

Govedarica, B., Kaiser, E., Rassamakin, Ju.Ja. and Samar, V.A., 2006. Der Grabhügel 'Tarasova Mogila' bei der Stadt Orechov. Neue Angaben zur Periodisierung und Chronologie der äneolithischen- und bronzezeitlichen Steppenkulturen im Azovgebiet. *Eurasia Antiqua* 12, 63–112.

Kaiser, E., 1999. Radiocarbon dates from Catacomb Graves. *Baltic-Pontic Studies* 7, 129–150.

Kaiser, E., 2003. *Studien zur Katakombengrabkultur zwischen Dnepr und Prut*, Archäologie in Eurasien 14. Mainz: Philipp von Zabern.

Kaiser, E., 2019. *Das dritte Jahrtausend im osteuropäischen Steppenraum. Kulturhistorische Studien zu prähistorischer Subsistenzwirtschaft und Interaktion mit benachbarten Räumen*, Berlin Studies of the Ancient World 37. Berlin: edition topoi.

Kalmykov, A.A., Belinskij, A.B., Hansen, S., Reinhold, S. and Hellström, K., 2022. *Der bronzezeitliche Großgrabhügel der Nekropole Rasševatskij-1 in der Steppe des Vorkaukasus*, Archäologie in Eurasien 41. Bonn: Habelt.

Kalmykov, A.A. and Reinhold, S., 2022. Die Bauphasen und zeitliche Abfolge der Befunde und Funde des Grabhügels. *In: Kalmykov et al. 2022*, 157–184.

Kiyashko, A.B., 1999. *Proiskhozhdenie katakombnoi kultury Nizhnego Podonya*. Volgograd: Izdatelstvo Volgogradskogo Gosudarstvennogo Universiteta.

Klein, L.S., 1970. Katakombnaya kultura ili katakombnye kultury? *In:* B.A. Kolchin and Ya.A. Sher, eds. *Statitistiko-kombinatornye metody v arkheologii*. Moscow, 165–179.

Kopyeva, T.A., 2021. *Katakombnaya kultura na territorii Krymskogo poluostrova: po materialam pogrebalnykh pamyatnikov*. St. Petersburg: Nestor-Istoriya.

Korenevskyi, S.N., Belinskyi, A.B. and Kalmykov, A.A., 2007. *Bolshoi Ipatovskyi kurgan na Stavropole kak arkheologicheskyi istochnik po epokhe bronzovogo veka za stepnoi granitse Vostochnoi Evropy i Kavkaza*. Moscow: Nauka.

Litvinenko, R.A., 2001. Kultura Babino (mnogovalikovoi keramiki) i ee mesto v sisteme bronzovogo verka Yuga Vostochnoi Evropy. *In: Bronzovyi vek Vostochnoi Evropy: kharakteristika kultur, khronologiya i periodizatsiya. Materialy mezhdunarodnoi nauchnoi konferentsii „K stoletiyu periodizatsii V.A. Gorodtsova bronzovogo veka yuzhnoi poloviny Vostochnoi Evropy" 23–28. Aprelya 2001 g.* Samara: Izdatelstvo OOO NTTs, 161–169.

Merpert, N.Ya., 1974. *Drevneishie skotovody Volzhsko-Uralskogo mezhdurechya*. Moscow: Nauka.

Mimokhod, R., 2013. *Lolinskaya kultura. Severo-zapadnyi Prikaspyi na rubezhe srednego i pozdnego periodov bronzovogo veka*, Materialy okhrannykh arkheologicheskikh issledovanyi 16. Moscow: Institut Arkheologii Rossyiskoi Akademii Nauk.

Nikolova, A.V., 1999a. Radiocarbon Dating of Graves of the Yamnaya and Catacomb Cultures on the Dnieper Right Bank. *Baltic-Pontic Studies* 7, 103–128.

Nikolova, A.V., 1999b. Radiocarbon Dates from the Graves of the Yamnaya Culture at the Ingulets River (the Kirovograd Region). *Baltic-Pontic Studies* 7, 80–102.

Nikolova, A.V. and Chernykh, L.A., 1997. Do odnieï kontseptsyi sotsialnoho rozvitku nosiïv katakombnoï kultury. *Arkheolohiya* 1, 107–119.

Panasyuk, N.V., 2014. Kurilnitsy mogilnika Zunda-Tolga (Respublika Kalmykia). *Vestnik RUDN, seriya Vseobshchaya istoriya* 3, 85–100.

Popova, T.B., 1955. *Plemena katakombnoi kultury. Severnoe Prichernomorye vo vtorom tysyacheletii do n. e*, Trudy Gosudarstvennogo istoricheskogo muzeya 24. Moscow: Gosudarstvennyi istoricheskoi muzei.

Pustovalov, S.Zh., 1982. K metodike periodizatsii katakombnoi kultury po dannym pogrebalnogo obryada. *In: Novye metody arkheologicheskikh issledovanyi*. Kiew: Naukova dumka.

Pustovalov, S.Zh., 1992. *Etnicheskaya struktura katakombnogo naseleniya Severnogo Prichernomorya*. Kiew: Naukova dumka.

Pustovalov, S.Zh., 1994. Economy and Social Organization of Northern Pontic Steppe–Forest-Steppe Pastoral Populations: 2750–2000 BC (Catacomb Culture). *Baltic-Pontic Studies* 2, 86–134.

Shishlina, N.I., 2007. Reconstruction of the Bronze Age of the Caspian Steppes. Life styles and life ways of pastoral nomads, *BAR International Series* 1876. Oxford: Archaeopress.

Shishlina, N.I. and Tsutskin, E.V., 2002. *Mogilnik Ostrovnoy. Itogi kompleksnogo issledovaniya pamyatnikov arkheologii Severo-Zapadnogo Prikaspiya*. Moscow, Elista: Gosudarstvennyi Istoricheskyi Muzei; Kalmytskyi Institut Sotsialno-Ekonomicheskikh Pravovykh Issledovanyi RAN.

Shishlina, N., Zazovskaya, E., Plicht, J., Hedges, R., Sevastyanov, V. and Chichagova, O., 2009. Paleoecology, Subsistence, and ^{14}C Chronology of the Eurasian Caspian Steppe Bronze Age. *Radiocarbon* 51(2), 481–499.

Shishlina, N., Zazovskaya, E., Plicht, J. and Sevastyanov, V., 2012. Isotopes, Plants, and Reservoir Effects: Case Study from the Caspian Steppe Bronze Age. *Radiocarbon* 54 (3–4), 749–760.

Stegantseva, V.Ya., 2020. Roots and chronology of the Early Catacomb ritual in the Northern Caucasus. *In:* M.T. Kashuba, S. Reinhold and Yu. Piotrovskij, eds. *Der Kaukasus zwischen Osteuropa und Vorderem Orient: Dialog der Kulturen, Kultur des Dialoges (zum 140. Gedenken an Alexander A. Miller). Internationale Fachtagung für die Archäologie und Humboldt-Kolleg (5.–8. Oktober 2015, Sankt Petersburg)*, Archäologie in Iran und Turan 19. Berlin: Dietrich Reimer Verlag, 391–404.

Telegin, D.Ya., Pustovalov, S.Z. and Kovalyukh, N.N., 2003. Relative and absolute Chronology of Yamnaya and Catacomb Monuments. The Issue of Co-Existence. *Baltic-Pontic Studies* 12, 132–183.

Trifonov, V.A., 1991. Stepnoe Prikubanye v epokhu eneolita – srednei bronzy (periodizatsiya). *In:* V.M. Masson, ed. *Drevnie kultury Prikubanya (po materialam arkheologigicheskikh rabot v zonakh melioratsii Krasnodarskogo kraya)*. Sbornik statei. Leningrad: Nauka, 92–166.

Trifonov, V.A., 2001. Popravki k absolyutnoi khronologii kultur epokhi eneolita-srednei bronzy Kavkaza, stepnoi i lesostepnoi zon Vostochnoi Evropy (po dannym radiouglerodnogo datirovaniya). *In: Bronzovyi vek Vostochnoi Evropy: kharakteristika kultur, khronologiya i periodizatsiya. Materialy mezhdunarodnoi nauchnoi konferentsii „K stoletiyu periodizatsii V.A. Gorodtsova bronzovogo verka yuzhnoi poloviny Vostochnoi Evropy" 23–28 aprelya 2001 g.* Samara: Izdatelstvo OOO NTTs, 71–82.

Trebur – Generationen und soziale Gruppen

Christoph Rinne, Ben Krause-Kyora

KEYWORDS: *Central Germany, Middle Neolithic, cemetery, radiocarbon dating, aDNA*

Zusammenfassung

Mit jeweils zehn Radiokarbondaten aus den Laboren Oxford und Kiel, die für 16 Gräber eine plausible Datierung liefern, wird ein zweiphasiges Modell mit Übergang erstellt, aus dem sich eine Belegung des Gräberfeldes von Trebur zwischen 4870 cal BC und 4590 cal BC ergibt. Eine Chronologie der Grabinventare lässt sich auf Grundlage neuer Korrespondenzanalysen der Gefäßverzierungen nicht nur für Hinkelstein, sondern auch zusammen für beide Inventargruppen darstellen. Hieraus ergibt sich ein überzeugendes Bild für die Belegungsabfolge auf dem Gräberfeld mit einem polyzentrischen Anfang, nach innen gerichteter Verdichtung und einem Ausbau in der Übergangsphase von Hinkelstein zu Großgartach. Verwandtschaft scheint bei der räumlichen Nähe der Beisetzungen nur eine nachgeordnete Bedeutung gehabt zu haben.

Abstract

A two-phase model with a transitional period was developed using twenty radiocarbon dates from the Oxford and Kiel laboratories, providing plausible dates for 16 graves. This model indicates that the Trebur cemetery was in use between 4870 cal BC and 4590 cal BC. New correspondence analyses of the vessel decorations have enabled the establishment of a chronology for the grave inventories, not only for the Hinkelstein culture but also for both inventory groups combined. This analysis paints a compelling picture of the burial sequence at the cemetery, beginning with a polycentric distribution, followed by an inward-oriented concentration, and culminating in an expansion during the transitional phase from Hinkelstein to Großgartach. The proximity of the burials suggests that kinship ties may have played a secondary role in burial practices.

EINLEITUNG

Wenn es um soziale Organisation, wirtschaftliche Praktiken und Ungleichheit geht, ist das Gräberfeld von Trebur einer der spannendsten Fundplätze in der prähistorischen Forschung des deutschen Neolithikums. Auf diesem Gräberfeld finden sich 137 Bestattungen beiderlei Geschlechts, die aufgrund einer sehr unterschiedlichen Ausstattung mit Beigaben zwei unterschiedlichen archäologischen Gruppen zugewiesen werden, Hinkelstein und Großgartach (Spatz 1999). Aus der exzellenten Vorlage dieses Gräberfeldes und Kombination zweier archäologischer Gruppen auf einem Gräberfeld ist ein intensiver Diskurs zur chronologischen und sozialen Differenzierung im 5. Jt. v. Chr. entstanden (u. a. Müller 2002; Dammers 2003; Falkenstein 2008). Die Toten sind in gestreckter Rückenlage mit dem Kopf im Südosten beigesetzt, nur die Hälfte der Großgartacher liegt exakt andersherum. Alle Gräber nehmen durch Reihen aufeinander Bezug, zugleich setzen sich aber einzelne Gruppen durch Abstand oder eine leichte Variation der Ausrichtung ab. Die archäologischen Gruppen unterscheiden sich zudem nicht nur durch die Keramik, sondern auch durch die weiteren Beigaben. Eine Clusteranalyse der von Helmut Spatz tabellarisch dargestellten Grabinventare visualisiert dies eindrücklich (Abb. 1).

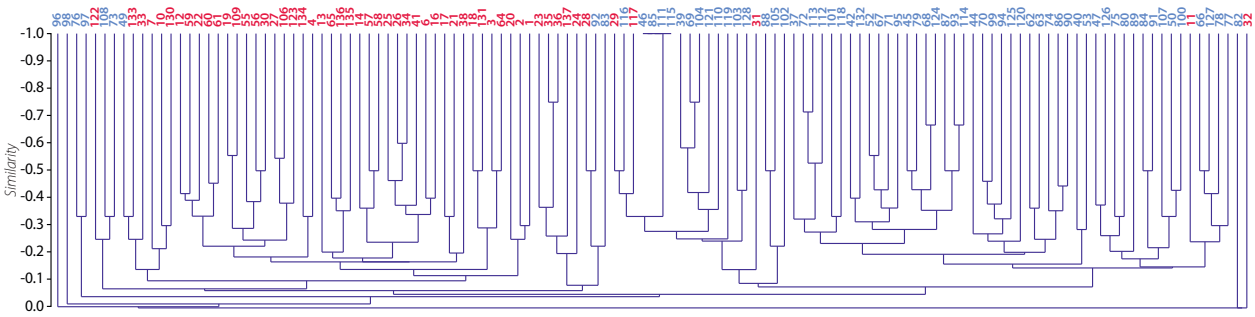

Abb. 1. Clusteranalyse zu den Beigabeninventaren in Trebur (Daten: Spatz 1999: Tabelle 72–74, 76–78). Grabnummer blau: Hinkelstein, rot Großgartach. Algorithm: Paired group (UPGMA), Similarity index: Jaccard, Constrains: None, Cophen. corr.: 0.703 (PAST 4.07b; Grafik: Christoph Rinne).

Hinzu treten die anthropologischen als auch paläopathologischen Studien und die Analysen von Isotopen (Dürrwächter *et al.* 2003, 2006; Kunter 2001; Teegen *et al.* 2003). Trotz des sehr hohen Anteils an Hirschgrandeln in den Hinkelstein Gräbern und einem daraus abgeleiteten Fleischkonsum zeigen die Isotopenanalysen keine Ernährungsunterschiede zwischen beiden Gruppen, wohl aber zwischen den Geschlechtern (Dürrwächter *et al.* 2003, 49–50).

RADIOMETRISCHE DATIERUNG

Für die absolute Datierung des Gräberfeldes lagen bisher 35 Daten vor, 25 aus Heidelberg nach traditionellem Verfahren und zehn AMS-Daten aus Oxford an zuvor schon datierten Gräbern (Kromer 1999). Die Daten aus Oxford zeigen insgesamt ein deutlich höheres Alter, so dass sich Zweifel in der Bewertung der Datierungen ergaben (Spatz 1999, 214, Tabelle 80; ders. 2001). Ein Versuch, dieses Dilemma zu lösen, bestand in der Korrelation der doppelt datierten Gräber und einer hieraus ermittelten Korrektur für die Heidelberg Daten zwischen –270 bis +10 Jahre, während bei den Daten aus Oxford nur zwei mit +40 und +120 Jahren angepasst wurden (Müller 2002, Liste 1). Als mögliche Ursachen für die unterschiedlichen Ergebnisse der Labore werden die Bereinigung einer moderne Kohlenstoffkomponente genannt (Müller 2002) und die Messungen einer Kontamination der Spongiosa der verwendeten Oberschenkel erwogen (Ramsey *et al.* 2002, 17). In der Folge wurden Heidelberger Daten grundsätzlich ausgeschlossen (z. B. Stöckli 2002, 68; Denaire *et al.* 2017, 1132).

Zu den 35 bisher vorliegenden Radiokarbondatierungen wurden zehn weitere in Kiel gemessen. Damit liegen für 13 Großgartacher und 18 Hinkelstein Gräber mindestens eine radiometrische Altersbestimmung vor (Tabelle 1). Die neu vorliegenden delta^{13}C-Messungen weisen nur die Probe KIA-52400 aus dem Grab 82 mit –15,06 als Ausreißer aus, die Kollagen-Ausbeute der Probe ist mit 6 % und einem C-Gehalt von 43 (+/–2) % aber im Durchschnitt der Kieler Probenserie. Darüber hinaus zeigen die neuen Proben keine Auffälligkeiten.

Ein erster Ansatz zur Berechnung und Interpretation der Daten ignoriert die möglichen labortechnischen

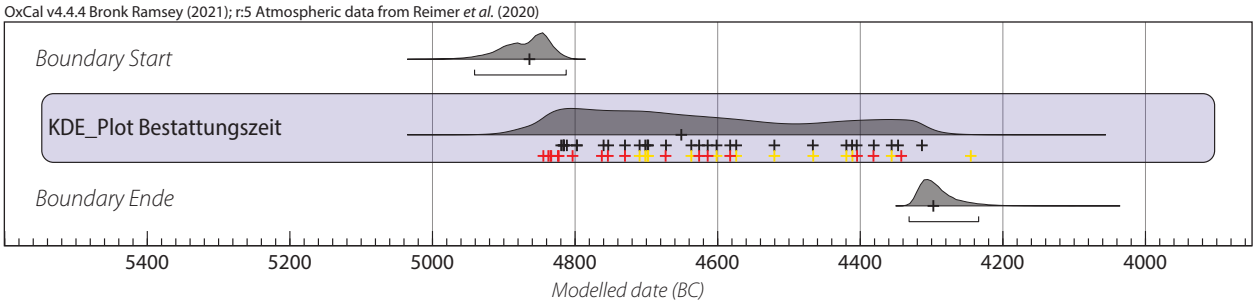

*Abb. 2. Modell zur Belegungszeit des Gräberfeldes auf der Grundlage aller potentiell valider Daten. **Kreuze**: Medianwert der Verteilung. Schwarz: modellierte Werte; **rot** Hinkelstein nicht modelliert; **gelb**: Großgartach nicht modelliert (Grafik: Christoph Rinne).*

Tabelle 1. Radiokarbondatierungen für ausgewählte Gräber aus Trebur. ***G*** *Großgartach,* ***H*** *Hinkelstein. Quelle für HD und OxA: (Kromer 1999; Ramsey* et al. *2002, 31).*

Grab-Nr.	Inventar	Lab	LabNr	BP	STD	d13C
16	G	HD	14947	5602	25	-20,68
17	G	HD	14811	5826	20	-20,03
17	G	OxA	5593	5910	90	-20,10
21	G	HD	15031	5729	16	-19,83
21	G	OxA	5594	5770	55	-19,50
25	G	HD	15314	5613	24	-20,52
31	G	HD	15465	5698	20	-20,03
38	G	HD	14812	5782	20	-19,92
40	H	HD	15449	5534	25	-20,52
42	H	HD	15227	5738	25	-20,08
52	H	HD	15079	5804	34	-20,39
52	H	OxA	5595	5840	55	-19,90
53	H	HD	14818	5586	26	-20,21
58	G	HD	15315	5622	26	-20,01
58	G	KIA	52397	5875	35	-19,08
58	G	OxA	5320	5840	55	-18,86
59	G	KIA	52398	5790	30	-20,87
60	G	HD	15450	5520	20	-20,74
61	G	HD	15210	5834	22	-20,05
67	H	HD	15076	5764	19	-20,24
68	H	HD	15273	4953	21	-21,16
68	H	OxA	5321	5945	55	-19,10
72	H	KIA	52399	5985	30	-21,22
82	H	KIA	52400	5915	35	-15,06
87	H	KIA	52401	5995	35	-18,66
94	H	KIA	52402	5970	35	-18,93
95	H	KIA	52403	6005	35	-19,73
106	G	HD	14948	5591	54	-20,54
106	G	OxA	5596	5685	55	-19,80
107	H	HD	14949	5669	32	-19,81
107	H	KIA	52404	6050	35	-19,08
107	H	OxA	5597	5835	55	-19,10
108	H	HD	15671	5893	39	-20,37
113	H	HD	15438	5857	31	-19,93
120	H	HD	14946	5493	36	-20,82
122	G	HD	15133	5375	27	-20,82
126	H	HD	14844	5773	31	-20,14
127	H	HD	15523	5842	30	-20,04
127	H	KIA	52405	5980	35	-20,33
127	H	OxA	5598	6065	70	-19,70
130	G	HD	15462	5433	32	-20,59
130	G	KIA	52406	5884	29	-19,36
130	G	OxA	5599	5760	55	-19,30
132	H	HD	15439	5959	33	-20,24
132	H	OxA	5322	5980	90	-19,44

Probleme und akzeptiert jedes Datum *a priori* als plausibel. Lediglich HD-15273 (Grab 68) wird wegen des deutlichen Abstandes von *ca.* 500 Jahren zur gesamten Probenserie und 1000 Jahren zur Vergleichsmessung ausgeschlossen. Die aus einem Grab stammenden Daten werden mit der combine-Funktion von OxCal vereinigt. Bei einem unauflösbaren statistischen Widerspruch aller Proben werden diese vollständig verworfen (vgl. Grab 107), bei einer möglichen Paarung von drei Proben wird nur der einzelne Ausreißer verworfen (vgl. Grab 127, 130). Unter dieser Prämisse entfällt eine Datierung für das Grab 107. Bei Grab 58, 127 und 130 können zwei der drei Proben kombiniert werden, wobei in allen Fällen die Messung aus Heidelberg wegen eines zu geringen Alters ausscheidet.[1] Damit können insgesamt 30 Gräber datiert werden (Suppl. 1).[2] Diese belegen mit den Medianwerten vor allem den Bereich zwischen 4850 cal BC und 4550 cal BC, während der Bereich bis 4300 cal BC etwas seltener belegt ist. Hieraus ergibt sich eine sehr lange Belegungszeit von 550 Jahren (Abb. 2, Suppl. 2). Die zehn ältesten Datierungen stammen aus Gräbern mit Hinkelstein Inventar, aber über das Gros der Zeit sind beide Inventargruppen nebeneinander vertreten.

Trotz der erfolgreichen Kombination der Daten von fünf Gräbern (17, 21, 52, 106, 132) zu validen Datierungen ist die lange Laufzeit für 137 Gräber, die aus der Akzeptanz aller Werte resultiert, auch im Kontext naheliegender und aktueller Chronologiemodelle weiterhin fraglich (Spatz 1996; dazu Denaire *et al.* 2017, 1111–1112 Abb. 15, 1137; vgl. Gleser 2012, 41–42 Abb. 3). Die bekannte Diskrepanz zwischen den Laboren wird mit den nun vorliegenden neuen Daten aus Kiel noch deutlicher. Das nachfolgend zur Visualisierung gewählte Modell stellt die Daten der jeweilige Inventargruppe als voneinander unabhängige Dichtekurven einer Phase in einer gemeinsamen Sequenz je Labor dar (Abb. 3, Suppl. 3). Die Abbildung zeigt deutliche Abweichungen in der Lage als auch in der Streuung der jeweils vorliegenden Daten, wobei die Heidelberger Serie mit 25 Datierungen, einschließlich des Ausreißers HD-15273 aus Grab 68, deutlich umfangreicher ist, als die jeweils zehn Daten aus Kiel und Oxford. Trotz vereinzelter Übereinstimmungen der Datierungen pro Grab sind die Differenzen der jüngeren AMS-Datierungen zu den Heidelberger Standardmessungen überdeutlich. Besonders stark differieren die modellierten Endpunkte, bezogen auf die jeweiligen Mittelwerte sind es 288 Jahre zu den Daten aus Oxford (OxA) und 362 Jahre zur Kieler Serie (KIA, Abb. 4). Die Diskrepanzen zwischen den

1 Die Heidelberger Messungen insg. in Frage zu stellen scheint wegen der erzielten Übereinstimmung bei den Gräbern 17, 21, 52, 106 und 132 nicht plausibel.

2 Alle Supplemente können unter folgender https://doi.org/10.57892/100-314 heruntergeladen werden.

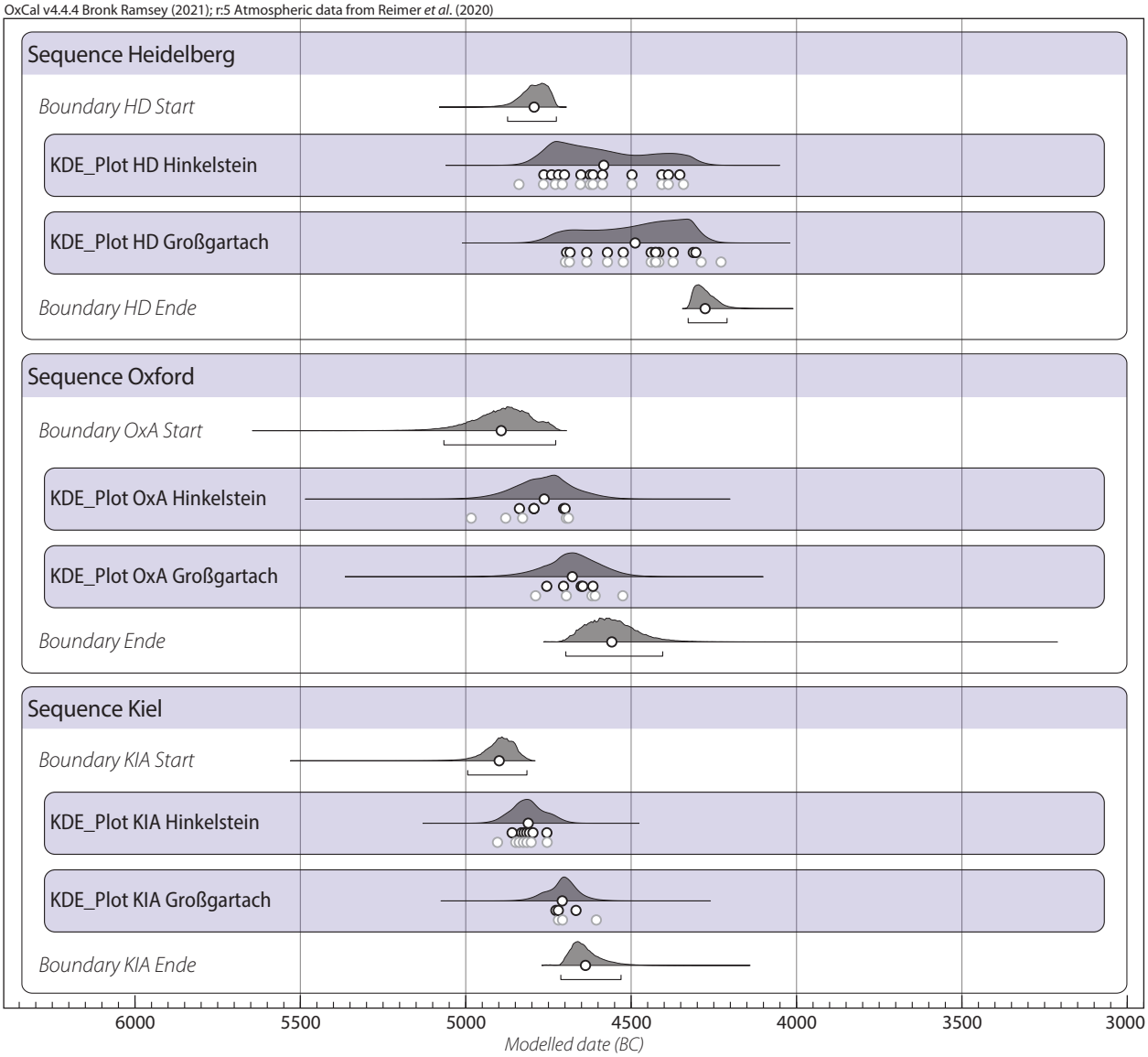

Abb. 3. Unabhängige Dichtemodelle innerhalb einer Sequenz mit Grenzbereichen für die Daten je Inventargruppe und Laborserie im Vergleich. Helle Kreise: nicht modellierte Mittelwerte, dunkel Kreise modellierte Mittelwerte (Supplement 3; Grafik: Christoph Rinne).

Serien aus Oxford und Kiel sind mit 14 Jahren (Start) und 74 Jahren (Ende) deutlich geringer. Die Unterschiede resultieren aus der Auswahl der Gräber, der deutlich größeren Standardabweichung der frühen AMS-Daten aus Oxford und vermutlich auch aus einer Weiterentwicklung der Laborverfahren seit 1999/2000.

Trotz der genannten Unterschiede erscheint es zulässig, die Datenserien aus Oxford und Kiel in einem Modell zur Datierung des Gräberfeldes zu verwenden und nur die Heidelberger Daten insgesamt auszuschließen. Hierbei werden die redundanten Daten für einzelne Gräber möglichst kombiniert (R_Combine: 58, 127, 130), was bei Grab 107 statistisch leider nicht plausibel ist, so dass hier ausschließlich KIA-52404 verwendet wird. In der Kieler Datenserie tritt die Abfolge von Hinkelstein zu Großgartach besonders deutlich hervor. Bezogen auf die 137 Gräber handelt es sich aber nur um eine kleine und nicht nach typochronologischen Gesichtspunkten ausgewählte Stichprobe. Letzteres trifft auf die Oxforder Daten zu, die Helmut Spatz auf der Basis der einfachen Standardabweichung eingehend diskutiert und insgesamt eher zu einem Nacheinander (106 > 107, 130 > 132) oder einer Gleichzeitigkeit (106=107) statt zu einem zuvor postulierten Hiatus kommt (Spatz 2001, 280). Zusätzlich zu den einfachen Grenzen für den Beginn und das Ende der Bestattungsperiode wird daher ein Trapezmodell für den Übergang von Hinkelstein zu Großgartach

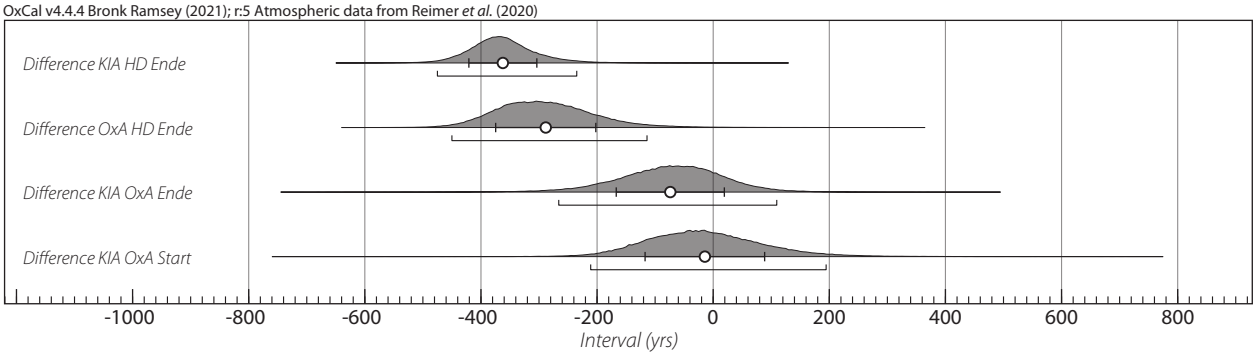

Abb. 4. Die Differenzen zu den modellierten Grenzwerten der Dichtemodelle. Enddaten KIA - HD, Enddaten OxA - HD, End- und Startdaten KIA - OxA (vgl. Abb. 3; Grafik: Christoph Rinne).

berechnet (Lee and Ramsey 2012). Durch die Verwendung beider Laborserien und die Kombination redundanter Datierungen gehen zehn Hinkelsteiner und sechs Großgartacher Gräber jeweils in einer Phase kombiniert in das sequenzielle Modell ein. Nur das Grab 106 (OxA-5596) erreicht mit 54 % keine ausreichende Übereinstimmung (mind. 60 %) mit dem Modell (Abb. 5, Suppl. 4).

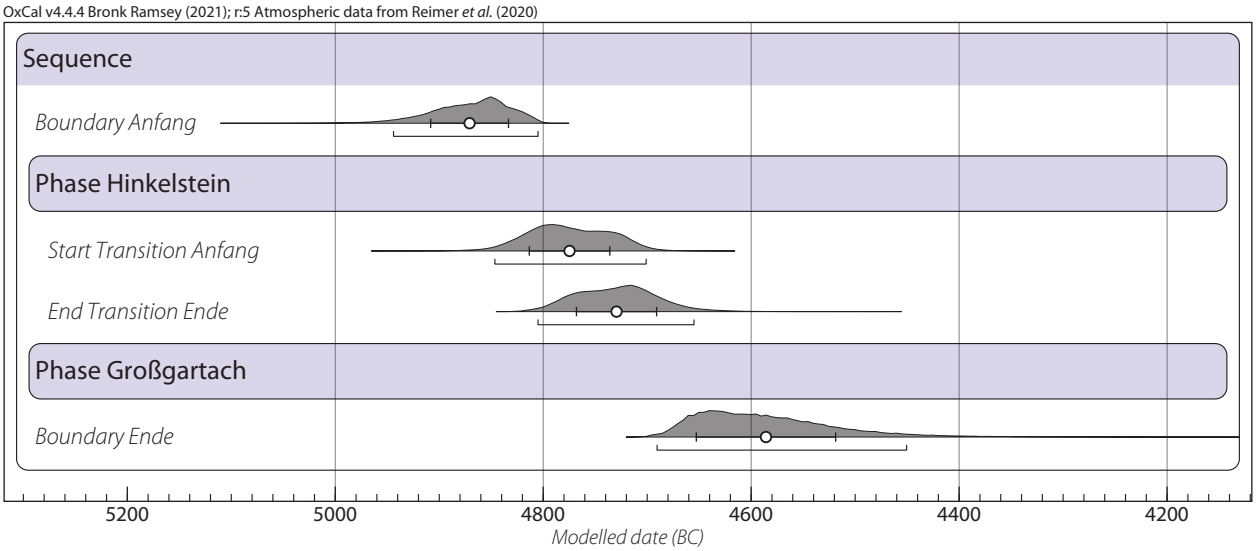

Abb. 5. Sequenzielles Modell zur Bestattungszeit in Trebur anhand der ^{14}C-Daten aus Oxford und Kiel mit einer Übergangsphase zwischen Hinkelstein und Großgartach (Grafik: Christoph Rinne).

Nach diesem Modell zweier sich überlappender Phasen beginnen die Bestattungen der Hinkelstein-Gruppe um 4870 cal BC und enden im Mittel 120 Jahre (60–180, 1-sigma) später, um 4730 cal BC (Abb. 6, Suppl. 4). Die Bestattungen der Großgartacher Gruppe beginnen um 4775 cal BC und dauern im Mittel 170 Jahre (85–250, 1-sigma) bis zum Ende der Bestattungen um 4590 cal BC. Bei diesen Zeitangaben ist aber die deutliche Variabilität schon bei der einfachen Standardabweichung zu beachten. Als grobe Schätzung ergeben sich aus der jeweiligen Belegungsdauer vier Generationen für Hinkelstein und fünf bis sechs Generationen für Großgartach. Zudem kann bei einer statischen Bevölkerung nach der Formel von György Acsádi und János Neméskeri mit rund 20 gleichzeitig lebenden Personen gerechnet werden (Acsádi and Neméskeri 1970, 65). Insgesamt ergeben sich aus dem vorliegenden Modell für 16 Gräber schlüssige Datierungen (Tabelle 2).

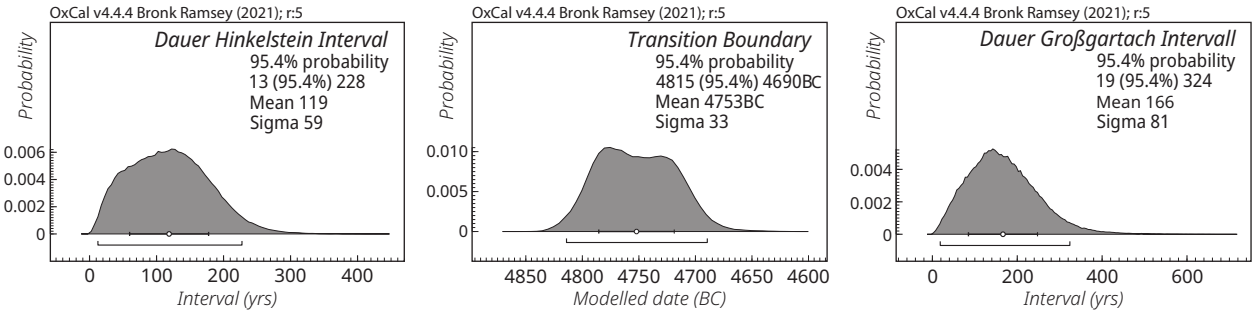

Abb. 6. Aus dem Sequenziellen Modell (Abb. 5) abgeleitete Wahrscheinlichkeiten für die Dauer von Hinkelstein, Großgartach und dem Zeitraum des Überganges (Grafik: Christoph Rinne).

Tabelle 2. Resultierende Datierungen der Gräber aus dem sequenziellen Modell für die Messungen aus Kiel und Oxford.

		unmodelliert					modelliert						
Grab	**Gruppe**	**von**	**bis**	**%**	**Mittel**	**Std.**	**von**	**bis**	**%**	**Mittel**	**Std.**	**A**	**C**
52	H	-4836	-4546	95,4	-4697	74	-4846	-4706	95,4	-4783	36	81,6	99,7
68	H	-4987	-4709	95,4	-4829	71	-4891	-4730	95,4	-4813	38	121,9	99,8
72	H	-4931	-4726	95,4	-4826	45	-4894	-4735	95,4	-4818	31	117,3	99,8
82	H	-4834	-4691	95,4	-4754	34	-4836	-4722	95,4	-4780	30	88,6	99,7
87	H	-4937	-4729	95,4	-4839	47	-4899	-4739	95,4	-4822	31	115,5	99,8
94	H	-4897	-4720	95,4	-4803	45	-4880	-4728	95,4	-4807	32	114,4	99,8
95	H	-4941	-4731	95,4	-4849	46	-4903	-4777	95,4	-4826	31	110,5	99,5
107	H	-4995	-4803	95,4	-4904	46	-4911	-4792	95,4	-4844	32	72,9	99,0
127	H	-4936	-4730	95,4	-4838	45	-4899	-4741	95,4	-4823	30	114,6	99,7
132	H	-5207	-4617	95,4	-4880	119	-4900	-4728	95,4	-4817	41	121,8	99,5
17	G	-5002	-4547	95,4	-4789	116	-4797	-4588	95,4	-4696	53	96,9	99,6
21	G	-4776	-4460	95,4	-4619	69	-4733	-4541	95,4	-4655	48	107,2	99,5
58	G	-4790	-4614	95,4	-4710	45	-4777	-4615	95,4	-4699	36	107,7	99,8
59	G	-4695	-4506	95,4	-4606	47	-4706	-4557	95,4	-4641	40	90,4	98,9
106	G	-4680	-4368	95,4	-4526	73	-4716	-4514	95,4	-4632	54	53,6	99,2
130	G	-4785	-4610	95,4	-4695	45	-4774	-4612	95,4	-4691	36	109,8	99,8

VERWANDTSCHAFT (aDNA)

Von den 91 Individuen mit erkennbarer Orientierung der Skelette sowie einer anthropologischen Bestimmung des Alters und des Geschlechts können 59 Hinkelstein und 31 Großgartach zugewiesen werden. Von diesen besser erhaltenen Skeletten liegen für 29 (17:12) Skelette Ergebnisse der genetischen Analyse vor (da Silva *et al.* 2023, 4 Tabelle 1). Genetisch können die Individuen beider Inventargruppen einer frühneolithischen Population, insbesondere Linienbandkeramik und Starčevo zugewiesen werden. Eine Differenzierung zwischen beiden Inventargruppen ist nicht erkennbar (da Silva *et al.* 2023, 5). Von den 406 möglichen Paarungen einer Verwandtschaft für diese 29 Individuen ergab die Analyse für elf Individuen acht Verwandtschaften ersten oder zweiten Grades (Tabelle 3). Bemerkenswert ist das Fehlen einer Verbindung zwischen Hinkelstein und Großgartach sowie der deutlich größere Anteil von erkannter Verwandtschaften bei Hinkelstein. Das Fehlen der Verwandtschaft zwischen den Inventargruppen ist aus der weitgehenden zeitlichen Abfolge (s. o.) und der offensichtlichen, restriktiven Trennung im Bestattungsritual zu erklären. Wegen der geringen Anzahl der Verwandtschaften, vor allem bei Großgartach, wird für den Unterschied in der erkannten Häufigkeit statt eines χ^2-Test Fischers exakter Test durchgeführt. Die Möglichkeit einer genetischen Verwandtschaft ist Abhängig von der Größe der Stichprobe und den hieraus resultierenden, möglichen Kombinationen. Für die

Tabelle 3. Verwandtschaft (aDNA) innerhalb von Trebur. Daten nach (da Silva et al. *2023, 6. Suppl. Abb. S6. Tabelle S1; Spatz 1999: Tabelle 72–74. 76–78).*

Grab 1	Geschlecht (aDNA)	Alter	Grab 2	Geschlecht (aDNA)	Alter	Gruppen	Verwandschaft
38	weiblich (F)	36–38	25	weiblich (F)	36–38	GG–GG	Zweiten Grades
44	weiblich (F)	20–72	83	weiblich (F)	20–72	HkSt–HkSt	Zweiten Grades
124	männlich? (M)	39–41	85	männlich? (M)	39–41	HkSt–HkSt	Ersten Grades
96	männlich (M)	49–51	50	männlich (M)	49–51	HkSt–HkSt	Ersten Grades, Vater-Kind
96	männlich (M)	49–51	132	männlich (M)	49–51	HkSt–HkSt	Ersten Grades
116	NA (F)	20–30	76	NA (F)	20–30	HkSt–HkSt	Zweiten Grades
76	weiblich (F)	24–25	83	weiblich (F)	24–25	HkSt–HkSt	Ersten Grades
50	männlich (M)	47–49	132	männlich (M)	47–49	HkSt–HkSt	Ersten Grades

Proportionen von den erkannten zu den darüber hinaus möglichen Verwandtschaften für die jeweils genetisch bestimmten Individuen (17 : 12) ergibt Fischers exakter Test einen Wahrscheinlichkeitswert auf Unterschiede zwischen Hinkelstein und Großgartach von 0,278.[3] Die Hypothese eines Unterschiedes zwischen den festgestellten und den möglichen Verwandtschaften der jeweiligen Inventargruppen kann somit nicht bestätigt werden.

KORRESPONDENZANALYSE

Die Untersuchung der Beigaben aus den Gräbern von Trebur wurde von Helmut Spatz anhand eines umfangreichen Merkmalskataloges gründlich und detailliert durchgeführt. Ein besonderer Schwerpunkt lag auf der Ornamentik, die ausgehend von der Verzierungstechnik und den Stichformen in einem umfangreichen Motivkatalog vorliegt (Spatz 1999, 52–84). Hierbei wird einleitend dargelegt, weshalb Gefäßform, die Position auf dem Gefäß und die Verzierung selbst als voneinander unabhängige Aspekte eines Gefäßes aufgefasst werden. Die Gründe sind im Wesentlichen: identische Muster auf verschiedenen Gefäßabschnitten, Verzierungen über einzelne Gefäßzonen hinweg oder weil die auf einem profilierten Gefäß getrennten Motive auf einem nicht profilierten Gefäß zusammengefasst werden müssen (Spatz 1999, 54–55). Der Musterkatalog, ohne die herausgestellten Gefäßformen, bildet die Grundlage für die nachfolgende typochronologische und statistische Analyse, die für Hinkelstein und Großgartach *a priori* getrennt erfolgt. Trotz der ausnehmend guten Datenaufbereitung bringen die Korrespondenzanalysen nicht die erhoffte klare Reihung der Merkmale in einer zeitlichen Ordnung. Die Seriation für Hinkelstein zeigt nur eine mäßig ausgeprägte Diagonale und die genannten Muster für die drei, von Helmut Spatz differenzierten zeitlichen Abschnitte und deren Grenzen zeigen eine sehr große Überlappung bei den zugehörigen Gräbern (Spatz 1999, 203–204 Abb. 114). Die Seriation der Großgartacher Gräber lässt keine chronologische Ordnung erkennen (Spatz 1999, 206). Eine weitere Analyse mit Ordnungsverfahren auf der Grundlage des von Helmut Spatz vorgelegten Kataloges oder eine erneute Datenerhebung wurde seitdem nicht durchgeführt.

Analyse von Helmut Spatz

Für einen ersten Test wurden die Daten der Korrespondenzanalyse zu den Hinkelsteiner Daten aus der zugehörigen Seriation von Helmut Spatz (1999) für eine erneute Korrespondenzanalyse übernommen. Die Ordnung für die ersten beiden Eigenvektoren entspricht weitgehend der publizierten Darstellung einer dreistrahligen Anordnung. Erst durch das Weglassen des fast durchgängig vertretenen Motivs Nr. 244 und des sehr seltenen Motivs 853, das vor allem Grab 40 eine sehr hohe Trägheit verleiht, ergibt sich eine parabelförmige Verteilung auf dem ersten gegen den dritten Eigenvektor (Abb. 7, Suppl. 5). Durch die Bedingung von mindestens drei Nennungen pro Zeile und Spalte fallen viele weitere, schwach besetzte Muster und Gräber weg.

3 Hinkelstein 7 : 129, Großgartach 1 : 65; in R: fisher.test (matrix(c(7,129,1,65), nrow=2)).

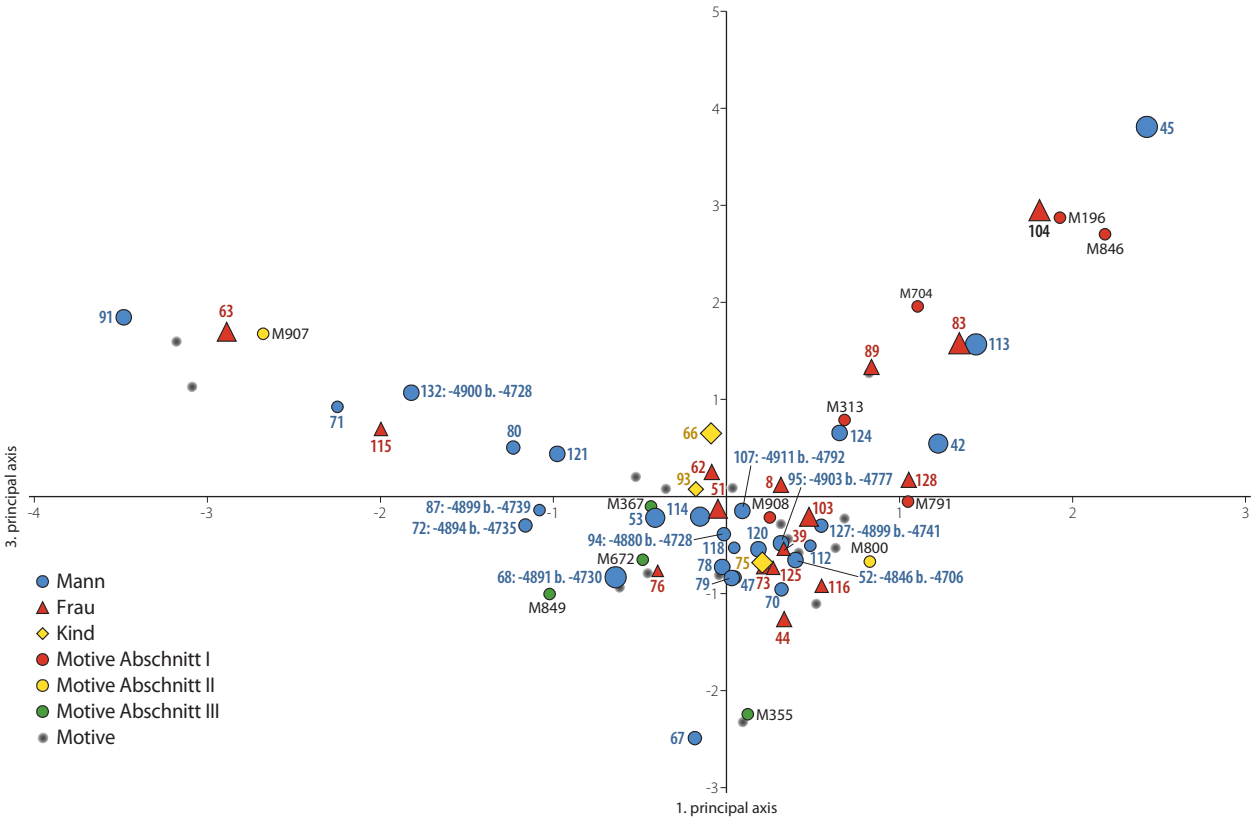

Abb. 7. Korrespondenzanalyse der Hinkelstein Gräber. Symbolgröße entspricht der Inertia, Grab-Nummer und 2-Sigma-Intervall der Radiokarbondatierung (Daten Spatz 1999, 203 Abb. 114. Grafik: Christoph Rinne).

Die prozentualen Erklärungsanteile nehmen mit eher geringen und schwach rückläufigen Werten ab,[4] so dass die erste und die dritte Achse zusammen nur 18 % der Variabilität erklären. In der Ordnung der Gräber deutet sich somit ein stetiger Wandel an. In dieser befinden sich die Motive des älteren Abschnitt I (M196, M313, M791, M846, M873 und M908) im rechten, positiven Abschnitt des 1. Eigenvektors und die Muster des jüngeren Abschnittes III (M355, M367, M672 und M849) im leicht negativen Bereich von 0 bis –1 (vgl. Spatz 1999, 203–204). Allerdings befinden sich die beiden Motive aus dem mittleren Abschnitt II (800, 907) sowohl im leicht positiven, als auch deutlich negativem Bereich dieser Achse. Das besonders hervorgehobene Motiv der Bäumchenfigur 906 ist wegen der geringen Anzahl in dieser Analyse leider nicht vertreten (Spatz 1999, 204). Ähnlich verhält es sich bei der Ordnung der Gräber. Die älteren Gräber 45, 104, 83, 113 und 89 (Tabelle 2; vgl. Spatz 1999, 203 Abb. 114) befinden sich im Vergleich zu der Ordnung von Helmut Spatz an identischer oder minimal versetzter Position der Ordnung. Im dichten Mittelfeld sind Verschiebungen um bis zu zehn Position zu seiner Abfolge vorhanden, während im jüngeren Abschnitt gegenüber den Ergebnissen von Helmut Spatz teils deutliche Veränderungen um 30 Positionen zu verzeichnen sind. Die hier jüngsten Gräber 91, 63, 71, 115 und 132 treten bei Helmut Spatz im mittleren Abschnitt auf (Spatz 1999, 203 Abb. 114). Die zuvor herausgestellten radiometrischen Datierungen der Gräber bestätigen die Erwartung einer zeitlichen Ordnung der hier erzielten Parabel nicht. In einem entsprechenden sequenziellen Modell in OxCal erzielen die Datierungen der Gräber 127 (54,6 %) und 52 (6,6 %) nur sehr geringe Übereinstimmungswerte. In der von Helmut Spatz erzielten Ordnung fallen drei Gräber durch teils sehr niedrige Übereinstimmungswerte auf: 52 (3,6 %), 94 (56,2 %) und 107 (15,8 %). Das erzielte Ergebnis der Korrespondenzanalyse der Motive bleibt unbefriedigend, vor allem im jüngeren Abschnitt. Dies könnte auf eine geringe zeitliche Tiefe oder auch auf eine zunehmende Komplexität der Bezüge in der Dekoration zurückzuführen sein. Die erzielte Ordnung ist nicht eindeutig chronologisch und betrifft zudem auch nur die Hinkelstein Gräber.

4 9.93, 9.23, 8.40, 7.94, 7.45, 6.51, 6.16, 5.05, 4.62

Versuch einer neuen Ordnung

Das ursprüngliche Ziel war es, eine Ordnung für alle Gräber zu erstellen, wobei die von Helmut Spatz im Katalog der Gräber vorgestellte Gefäßklassifikation und die den einzelnen Gefäßen zugeordneten Merkmale verwendet werden sollten. Aus den von Helmut Spatz im Katalog vorgelegten Daten ergeben sich jedoch zahlreiche Probleme für ein Ordnungsverfahren.[5]

Durch die detaillierte Differenzierung werden die Informationen zu stark zerstückelt und durch die regelmäßig vorhandene Fragmentierung der Gefäße mit der daraus resultierenden Unschärfe der Information, ausgedrückt durch Fragezeichen oder aggregierte Merkmalseinheiten, wird die Anzahl der Kleingruppen noch erhöht. Für die 128 Gräber mit Gefäßbeigaben ergeben sich folgende Zählungen. Von 72 Gefäßtypen sind allgemeine Kümpfe und Bauchknickgefäße je 47-mal vertreten, während am anderen Ende 22 singuläre Nennungen von Typen stehen. Erstere tragen zu einer klaren Trennung der Inventargruppen bei (s. u.), letztere entfallen als Information schon vor der Analyse. Wird die Häufigkeit von diesen Gefäßtypen nach Gräbern differenziert ausgezählt, so ist in 292 Fällen ein Gefäßtyp singulär pro Grab vertreten, Paarungen treten 34-mal auf und die Häufung von drei, vier und sieben gleichen Typen in einem Grab sind sehr seltene Ereignisse (Tabelle 4).

Tabelle 4. Anzahl von Gefäßtypen je Grab nach der Differenzierung von Helmut Spatz (1999). Datenquelle s. Suppl. 9, view geftyp_grab_count.

Gefäßtypen Anzahl pro Grab	Häufigkeit
1	289
2	35
3	3
4	3
7	1

Tabelle 5. Anzahl von Merkmalsausprägungen auf den Gefäßen pro Grab nach der Differenzierung von Helmut Spatz (1999). Datenquelle s. SQLite DB, view merkmal_grab_count.

Anzahl von Merkmal pro Grab	Häufigkeit
1	1033
2	84
3	10
4	1

Ähnlich verhält es sich mit den Merkmalen, vor allem der Verzierung der Gefäße, ergänzt durch die Handhaben. Die 562 im Katalog genannten Merkmalsausprägungen auf den Gefäßen treten aggregiert nach den Gräbern 1033-mal singulär und 84mal doppelt auf, drei- und vierfaches Auftreten sind seltene Ereignisse (Tabelle 5). Die Anzahl der gemeinsamen Merkmalsausprägungen unterscheidet sich aber deutlich. Die rundliche Knubbe (Kr-1) ist insgesamt 38-mal vertreten und wird eher wenig zu einer Differenzierung beitragen. Die zweifache Nennung einer Merkmalsausprägung tritt noch 68-mal auf und die individuelle Nennung eines Merkmals ist 414-mal vertreten. Dies entsteht u. a. durch die ergänzende Trennung der Motive in ihrer Verwendung, z. B. als Bogenband oder Füllmotiv (Spatz 1999, 54–55 Abb. 26). Allerdings bietet die detaillierte Differenzierung natürlich die Möglichkeit, die Information nach unterschiedlichen Kriterien zu aggregieren.

Ein weiteres Problem stellt die stets dominante Trennung zwischen Hinkelstein und Großgartach dar. Zwar können nachgeordnete Achsen dann auch eine chronologische Reihe darstellen, aber die Integration von Merkmalen, die zu dem gesteckte Ziel keinen oder nur einen geringen Beitrag leisten können, führt zu Unschärfen und einer zunehmenden Reduktion der Anteile der einzelnen Merkmale an der Gesamtvariabilität. Es sollte also versucht werden, die für die Inventargruppen charakteristischen Merkmale zu vermeiden. Obwohl hierbei bereits auf die Grundform, also das Muster oder die Applikation ohne die Varianten nach dem „–“ reduziert wird und Unsicherheiten, durch ein „?“ ausgedrückt, ignoriert werden, sind verbindende Merkmalsausprägungen leider weiterhin bei Weitem in der Unterzahl. Von verbleibenden 238 Merkmalsausprägungen sind nur zwölf in beiden Inventargruppen vertreten und das mit einem überwiegend deutlichen Ungleichgewicht (G:H): 006 (19:1), 058 (8:1), 370 (1:2), 402 (1:1), 550 (12:1), 721 (3:81), 731 (1:1), 776 (4:1), Bf (7:1), Koh (38:7), Kr (33:6), Öv (17:6).[6]

Bei den Gefäßtypen wird *a priori* auf die Aggregierung auf den Typ verzichtet, da die Varianten erfahrungsgemäß chronologisch sensibel sind. Von den 60 resultierenden Gefäßtypen sind nur neun in beiden Gruppen vertreten: Bk (41:2), Fs (1:2), Fs-2 (5:3), Kf-1 (1:2), Mi (2:1), Na-1 (2:1), Nt (1:2), Nt-1 (1:13), Nt-2 (2:3).[7] Werden die Gefäßtypen auf ihre jeweilige Grundform aggregiert, zeigt sich, dass die Bauchknickgefäße

5 Die Daten stehen im Supplement 9 als SQLite Datenbank zur Verfügung: spatz_terbur_katalog.sqlite. Diese beinhaltet als *views*, der (für einzelne Analysen jeweils) zusammengestellten Daten.

6 Suppl. 9, view merkmal_gruppe_count

7 Suppl. 9, view geftyp_gruppe_count

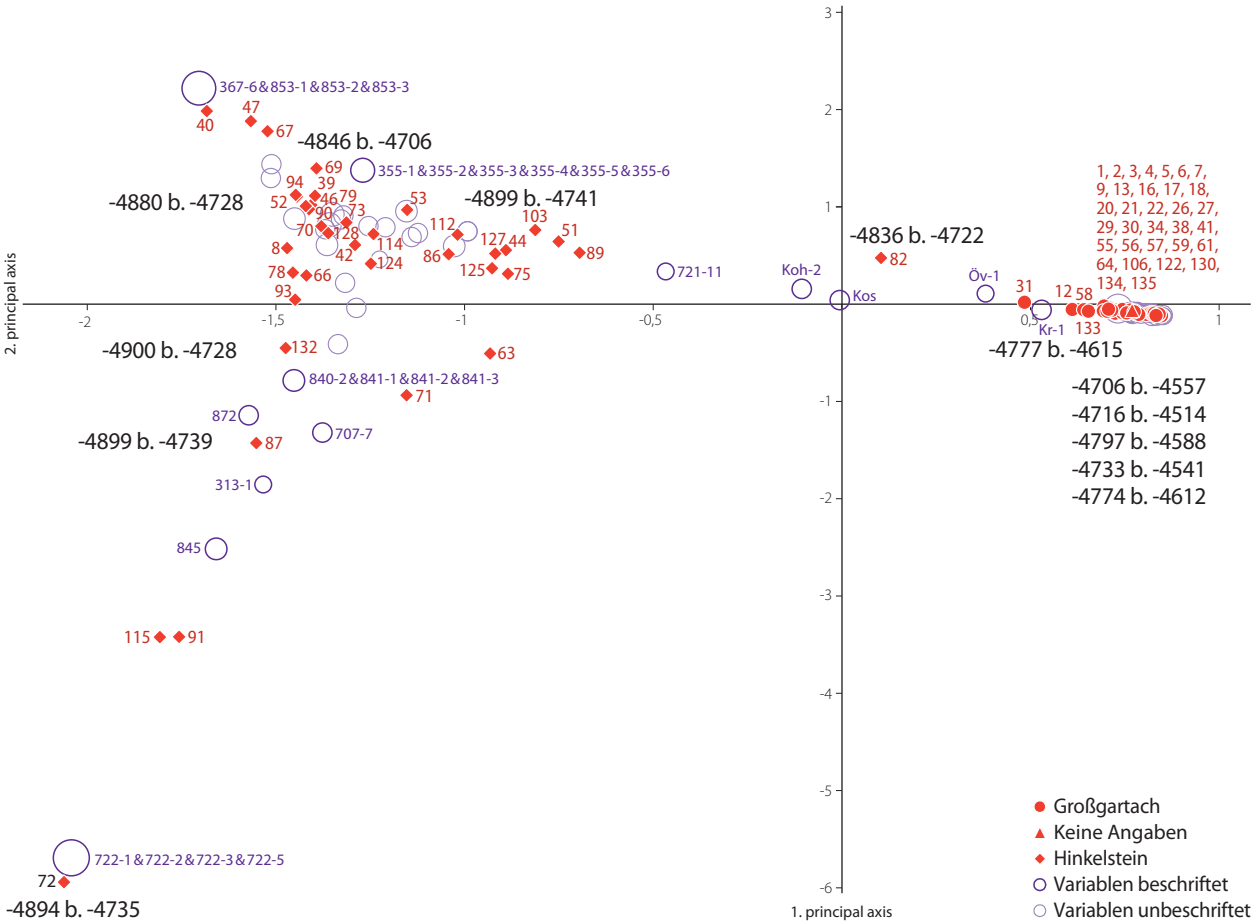

Abb. 8. Korrespondenzanalyse der Merkmalsausprägungen für alle Gräber aus Trebur (Symbolgröße proportional zur Inertia). Modellierte Datierungen des Trapezmodelles (vgl. Tabelle 2, Grafik: Christoph Rinne).

(Bk, 86:2) und Kümpfe (Ku, 0:158) hoch spezifisch für die Inventargruppen sind. Daneben sind aber immerhin neun aus 16 Grundformen als seltenes Ereignis in beiden Inventargruppen belegt: Bk (86:2), Fl (1:2), Fs (20:5), Kf (1:6), Mi (2:1), Na (3:2), Nt (6:18), Sc (2:5), Zs (20:13).[8]

Nach der vorangehenden Quantifizierung der Merkmalsausprägungen auf den Gefäßen und den Gefäßtypen aus dem Katalog von Helmut Spatz (1999) scheint eine gemeinsame Analyse mit dem Ziel einer chronologischen Ordnung für das gesamte Gräberfeld unmöglich. Dennoch wurden mehrere Datenselektionen und Aggregierungen der Merkmalsausprägungen versucht, von denen zwei Analysen im Folgenden kurz vorgestellt werden sollen. Die Aggregation der Daten für diese Varianten erfolgt in Kenntnis der Merkmalskoinzidenzen in den vorangegangenen Analysen und unter Berücksichtigung der Radiokarbondatierungen für die Gräber.[9] Es werden 94 Merkmalsausprägungen zu 31 Kombinationen aggregiert (agg05), womit in dieser Analyse insgesamt 127 Merkmalsausprägungen aus 71 Gräbern vorliegen. Nach ersten Berechnungen werden die Merkmale Kos, 313-1 und 872 ausgeschlossen, da diese als seltene Ereignisse und durch ihre Kombination in den Gräbern starke Verzerrungen des Resultates bewirkten. Durch die Bedingung von mindestens je drei Variablen und Gräbern gehen in die endgültige Berechnung nur 30 Merkmalsausprägungen, davon 20 Kombinationen, und 35 Gräber ein (Abb. 8, Suppl. 6). Die Berechnung der ersten neun Eigenvektoren unter der Prämisse von mindestens drei Gräbern und drei Merkmalen ergibt deutlich höhere Erklärungsprozente als für die Daten von Helmut Spatz und die nach der dritten Achse zudem erkennbar abfallen: (Erklärungsprozente: 11,9, 10,3, 10,0, 7,8, 7,7, 6,4, 5,8, 5,5, 4,5). Die Darstellung der ersten beiden Achsen zeigt eine mäßige, eher entlang der ersten Achse verlaufende Parabel.

8 Supplement 9, view geftyp_agg_gruppe_count

9 Supplement 9, views ca_grab_merkmal_agg05, ca_grab_merkmal_agg06

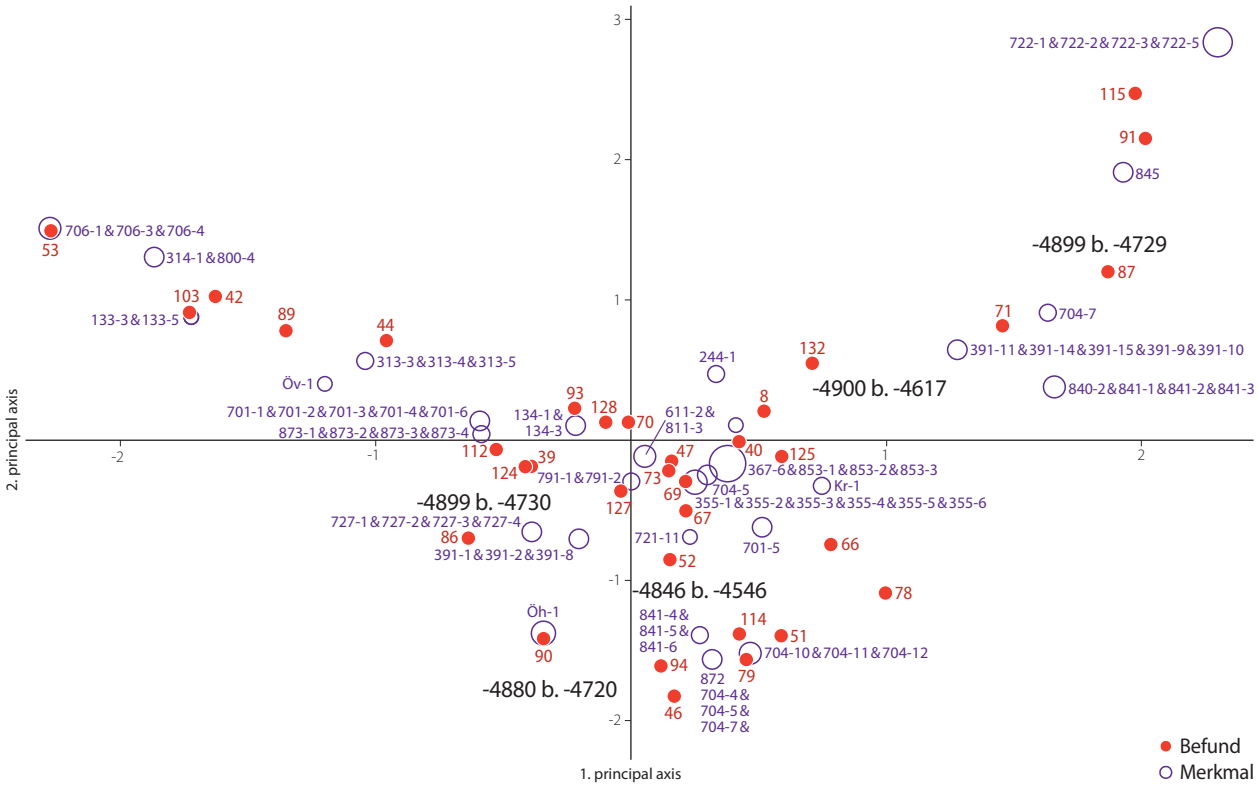

Abb. 9. Korrespondenzanalyse mit aggregierten Merkmalen (vgl. Abb. 8), gefiltert auf Hinkelstein. Modellierte Datierungen des Trapezmodelles (vgl. Tabelle 2, Grafik: Christoph Rinne).

Die Hinkelsteiner Gräber liegen bis auf Grab 82 vollständig im negativen und die Großgartacher im positiven Bereich des ersten Vektors. Während die Hinkelstein Gräber durch beide Achsen einigermaßen aufgespannt werden, liegen die Großgartacher als kompakte Reihe unmittelbar auf der ersten Achse. Diese Anordnung wird auch in der zugehörigen Seriation des ersten Eigenvektors gut deutlich. Diese zeigt eine klare Zweiteilung, mit einer mäßigen Reihe entlang der Diagonale für Hinkelstein und einer eher verstreuten, flächigen Darstellung für Großgartach. Die gewählten Merkmale und Eigenvektoren sind nicht wirklich geeignet, hier eine Ordnung zu erzielen. Die vorliegenden radiometrischen Datierungen passen zu dieser Ordnung. Die Reihe der Hinkelsteiner Gräber lässt sich weitgehend in einer stimmigen Sequenz modellieren, lediglich Grab 127 ist gegenüber seiner Position zu alt und erzielt nur 50% Übereinstimmung. Von den sechs nachfolgenden Großgartacher Datierungen fallen insg. drei Daten mit einer unzureichenden Übereinstimmung auf (106: 43,8%, 17: 50,1%, 130: 25%). Dies bestätigt den visuellen Eindruck einer mäßigen Ordnung anhand der Seriation. Da bei Hinkelstein nur eine Datierung aus der Reihe fällt, scheint die gewonnene Ordnung in diesem Fall den Faktor „Zeit“ sogar besser wiederzugeben als die vorangegangene Analyse auf Basis der Daten von Helmut Spatz.

Aus diesem Grund wurde eine weitere Variante mit identischer Aggregierung der Merkmalsausprägungen (agg006) durchgeführt, jedoch nur bezogen auf die Hinkelstein-Bestattungen. Zu den Merkmalen Kos, 313-1 und 872 wurde in diesem Fall auch das Grab 72 wegen extremer Werte ausgeschlossen (Abb. 9, Suppl. 7). Die Seriation der ersten Achse zeigt aufgrund der Filterung auf Hinkelstein keine klare Zweiteilung. Eine gute Parabel mit ausreichend belegten Armen und mit einer noch erkennbaren Agglomeration von Gräbern im Scheitelpunkt wird in der Darstellung des ersten gegen den dritten Eigenvektor erreicht, zusammen immerhin 21% der berechneten Variabilität im Datenbestand. Das auf den ersten Blick erfreuliche Ergebnis kann nach den Radiokarbondaten aber nicht überzeugend chronologisch gedeutet werden. Ein sequentielles Modell in OxCal von Grab 127 im Zentrum zu Grab 87 am positiven Ende der Parabel liefert für vier Datierungen im Zentrum der Parabel Übereinstimmungen, aber gerade Grab 87 am differenzierenden Ende der Parabel, passt mit nur 38,1% Übereinstimmung nicht in diese Reihe. Bei einer Invertierung der Reihe haben zwar zwei der fünf Datierungen eine unzureichende Übereinstimmung, diese sind für sich aber deutlich besser, so dass eine zeitliche Abfolge auch invertiert vorliegen könnte (52: 59,7%, 127, 50,3%, vgl. Suppl. 7).

Insgesamt stellt sich die Frage nach der Übereinstimmung der jeweils gewonnenen Ordnung untereinander, insbesondere auch für die Entscheidung über die zeitliche Richtung der Ordnung im zuletzt dargestellten Fall. Hierfür wurde in R eine Funktion geschrieben, die für einen Vektor die Differenz zur Position in einem zweiten Vektor bestimmt. Neben der visuellen Kontrolle geben der Mittelwert und die Standardabweichung ergänzende Hinweise auf die Verteilung der Differenzen (vgl. Suppl. 8). Die Ordnung der Gräber nach den Daten der Abb. 114 von Helmut Spatz und die gemeinsame Analyse (agg05, H114.HG) liefert eine vielfach ähnliche Reihung, lediglich Grab 63, 71, 8 und 128 sind mindestens 20 Positionen verschoben. Der Mittelwert der Differenzen liegt bei 9,78 und die Standardabweichung bei 7,73. Der Vergleich der Ordnung nach Abb. 114 von Helmut Spatz mit der letzten Analyse agg06b (H06b.H_114) zeigt durchweg sehr hohe Differenzen, vor allem am Anfang und am Ende der Reihe, so dass eine Invertierung der Ordnung naheliegt. Das Ergebnis der invertierten Ordnung liefert deutlich geringere Differenzen mit einem Mittelwert von 8,68 (Std. 6,45) statt 18,24 (Std. 11,91). Sehr ähnlich verhält sich auch der Vergleich zwischen der Analyse agg06b und der gemeinsamen Analyse aller Gräber (H06b. HG, H06b_rev.HG). Auch hier liefert die invertierte Reihe eine deutlich größere Ähnlichkeit. Sofern in der letzten Korrespondenzanalyse eine zeitliche Ordnung zu sehen sein sollte, befindet sich demnach der ältere Abschnitt rechts, am positiven Ende des ersten Eigenvektors (vgl. Abb. 9).

Zahlreiche Versuche, innerhalb der Großgartacher Gräber eine Ordnung zu erzielen, haben kein auch nur im Ansatz plausibles Ergebnis geliefert. Diese Erfahrung entspricht der Arbeit von Helmut Spatz (Spatz 1999, 206). Allerdings können wir nach den vorliegenden Radiometrischen Datierungen nicht von einer kurzen Zeitspanne, sondern im Verhältnis zur Hinkelsteiner Belegung von einer längeren Bestattungszeit ausgehen. Demnach scheint der Gestaltungswille bei der Verzierung der Keramik weniger ausgeprägt als bei Hinkelstein bzw. wertkonservativer zu sein. Die hier vorgestellte Reihe für Hinkelsteiner und Großgartacher Gefäßverzierungen aus einer größeren Anzahl der Gräber zeigt in mehreren Analysen einen stetigen Wandel. Ein sich im Laufe der Zeit wandelndes Stilempfinden scheint aber leider nicht der dominierende Grund gewesen zu sein, da für Hinkelstein keine uneingeschränkte Korrelation mit den vorliegenden Radiokarbondatierungen erreicht wird und für Großgartach in keinem Fall eine gute Einordnung erzielt wird. Dennoch scheint die erzielte Ordnung (vgl. Abb. 8) als Hypothese für weitere Analysen akzeptabel, z. B. für die Belegungsabfolge auf dem Gräberfeld.

BELEGUNG DES GRÄBERFELDES

Die Belegung des Gräberfeldes ist unter verschiedenen Gesichtspunkten untersucht worden. Während auf den ersten Blick die weitgehende Trennung zwischen Hinkelstein und Großgartach deutlich wird, hebt Helmut Spatz für Hinkelstein neben geschlechtsspezifischen Gruppen auch Ausstattungsgruppen hervor, die sich in den Großgartacher Gräbern nicht in gleichem Maße feststellen lassen (Spatz 1999, 241–244). Hierbei entstehen eher einzelne Agglomerationen innerhalb des Gräberfeldes, die sich auch in den Grababständen wiederfinden.[10] (Spatz 1999, Taf. 188). Im deutlichen Unterschied hierzu steht das alternative Modell von mehreren Gräberreihen innerhalb von drei Gruppen und einer darin ablaufenden Belegung auf Grundlage interpolierter ^{14}C-Datierungen[11] (Müller 2002, 153 Abb. 4.10). Bei Helmut Spatz wird die zentrale, von Hinkelstein dominierte Gruppe I stark gegliedert, Gruppe II wird eher nach dem Geschlecht in a und b getrennt, während die Gruppe III die Randbereiche im Norden (a), Westen (b) und Süden (c) umfasst. Damit sind bei Helmut Spatz 120 Gräber einer Gruppe zugewiesen, bei Müller sind es 85 Gräber, wobei hier vor allem die Randbereiche ausfallen.

Werden die Werte des ersten Eigenvektors der gemeinsamen Korrespondenzanalyse (agg005) in fünf gleichgroße Klassen unterteilt und in der räumlichen

10 Ia: 104, 105, 98, 97, 99, 118, 115, 103. Ib: 48, 43, 51, 8. Ic: 76, 82, 83, 92, 88, 89. Id: 81, 110, 111. Ie: 46, 39, 37, 49. If: 102, 100, 101, 96, 95, 94. Ig: 84, 91, 114, 112, 113. Ih: 71, 72, 80, 108, 79, 70, 42, 52, 53, 78, 50, 87. Ii: 47, 44, 40, 45. Ik: 63, 67, 69, 68. IIa: 125, 126, 129, 128. IIb: 120, 116, 121, 119, 126, 127, 124, 132. IIIa: 130, 131, 137, 136, 135, 134, 133. IIIb: 117, 122, 107, 106, 123. IIIc: 55, 6, 12, 13, 15, 18, 14, 16, 7, 17, 21, 22, 20, 23, 24, 25, 29, 11, 30, 31, 26, 19, 28, 57, 58, 33, 59, 60, 36, 35, 34, 38, 32, 9, 27, 10, 61, 56, 65, 64. Auf dem Plan Taf. 188 wurden die Nummern der Gräber 116 und 118 vertauscht.

11 Rot_1: 80, 109, 108. Dunkelblau: 81, 91, 113, 111. Blau: 69, 68, 72. Gelb_1: 84, 87, 86, 114, 112. Gelb_2: 57, 58, 59, 60. Violet: 62, 63, 67, 73, 71. Hellblau: 82, 79, 89, 90, 93, 115. Grün: 74, 70, 83, 78, 85, 88, 94. Weiß: 66, 75, 54. Rot_2: 46, 49, 52, 53, 92, 95, 99, 118. Dunkelgrau: 24, 25, 29. Braun_1: 36, 35, 41, 39, 37, 50, 48, 96. Gelb_3: 125, 126, 129. Türkis: 116, 119, 127. Dunkelgrün: 22, 23, 31, 34, 42, 38. Taupe: 44, 40, 51, 101. Hellgrün: 17, 20, 26, 28. Braun_2: 47, 45, 43, 102, 100, 104.

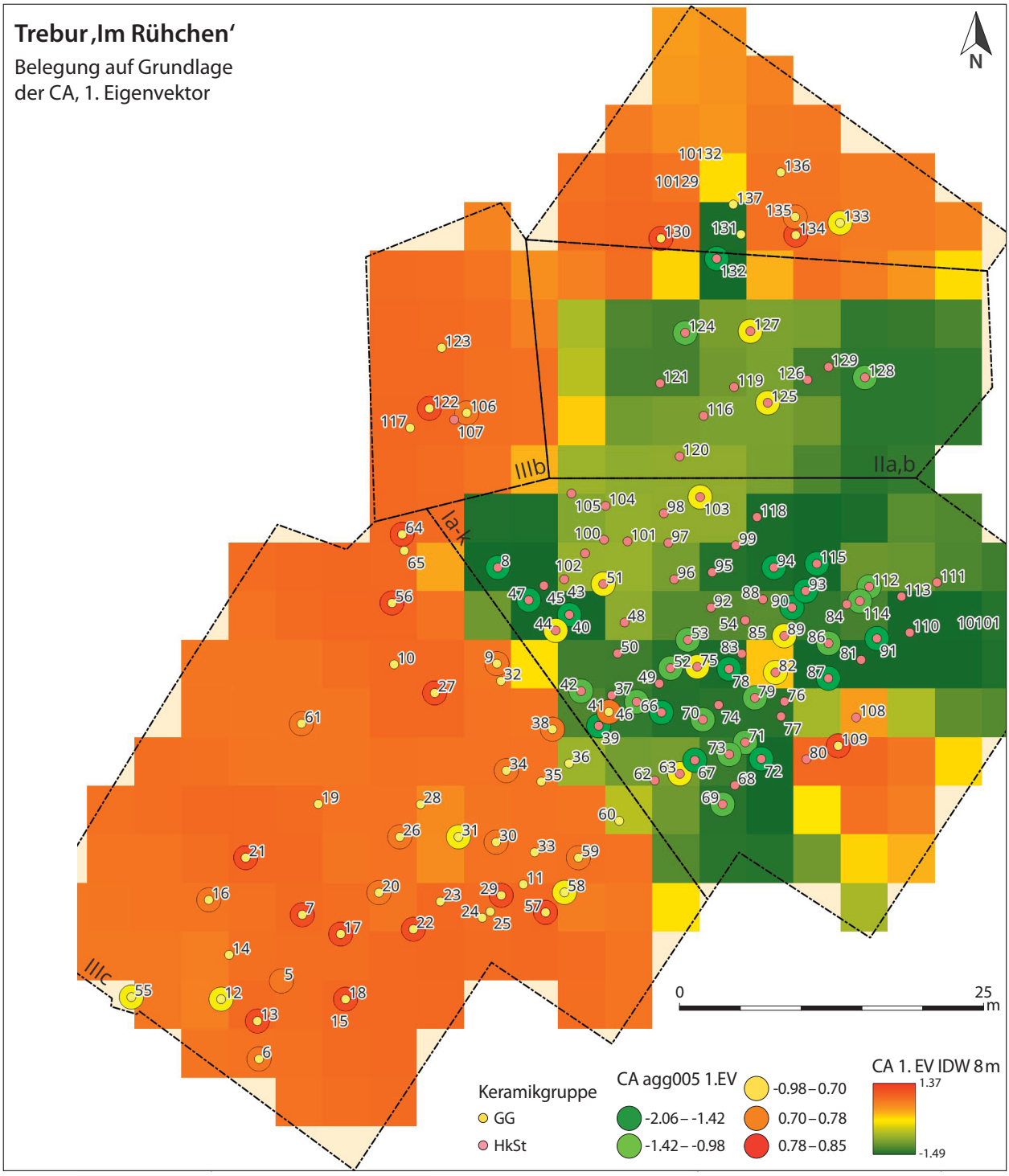

Abb. 10. Belegungsabfolge nach dem 1. Eigenvektor der gemeinsamen Korrespondenzanalyse (agg005). Darstellung der einzelnen Gräber und der resultierenden Dichteinterpolation (IDW Abstandskoeffizient 8 m, Rasterweite 4 m (Grafik: Christoph Rinne).

Verteilung kartiert, ergibt sich ein teils bekanntes Bild der Entwicklung (Abb. 10). Die Belegung beginnt in dem zentralen Areal Ia-k in drei oder vier Zentren, die von den Gräbern (8, 40, 47), (39, 66, 67,72, 78), (87, 91) und (90, 93, 94, 115) gebildet werden (Werte: –2,06 bis –1,42). Zu ergänzen ist das Grab 132 im nördlich anschließenden Bereich IIa,b. Bei einer leicht zu den niedrigeren Werten (älter) verschobenen Klassengrenze

(–1,48) entfällt dieses Grab und es bleiben drei Zentren mit den Gräbern (40, 47), (67, 72) und (87, 91, 115). Im folgenden Abschnitt (bis –0,98) verdichtet sich der zentrale Bereich Ia-k deutlich und im nördlich anschließenden Areal kommen die Gräber 124 und 128 dazu. Erst in der Übergangsphase (bis 0,7) wird in einem Zug die gesamte Fläche mit Gräbern erschlossen (Nord nach Süd: 133, 125, 127, 31, 58, 12, 55) und der zentrale Bereich fast abschließend belegt. In den beiden folgenden Phasen werden fast ausschließlich der südliche und der nordwestliche Randbereich belegt. Lediglich Grab 41 und 109 befinden sich in deutlicher Nähe zum initialen Kernbereich der Belegung. Eine ergänzende Interpolation (IDW, Abstandskoeffizient 8 m Rasterweite 4 m) verdeutlicht die vorangehend beschriebene Entwicklung, die wie folgt gedeutet werden kann. Ausgehend von drei bis vier Zentren im Bereich Ia-k und dem deutlich außerhalb liegendem Grab 132, das möglicherweise erst später hinzukommt, verdichtet sich das so definierte Bestattungsareal vor allem nach innen bis zum mittleren Abschnitt, der zugleich den Übergang nach Großgartach darstellt und die Erschließung eines deutlich erweiterten Bestattungsareals mit sich bringt. Mit den folgenden Bestattungen wird dieser neu erschlossene Bereich bis zum Ende der Bestattungsperiode wieder dichter mit weiteren Bestattungen belegt.

Neben der chronologischen Abfolge in der Belegung der Gräber weist dieser polyzentrische Befund auf eine weitere Unterteilung des Gräberfeldes in Bestattungsgemeinschaften hin. Neben der offensichtlichen Trennung nach den beiden Inventargruppen ist eine familiäre Bindung möglich. Allerdings beträgt die Distanz zwischen den genetisch erkannten Paarungen mindestens das Dreifache der mittleren triangulierten Abstände zwischen den Gräbern und die Distanzen zwischen den Verwandtschaften ersten Grades sind mit 19,4 m im Mittel sogar etwas größer als zwischen denen des zweiten Grades mit 18,6 m (Tabelle 6). Die vorliegenden Daten sprechen insgesamt gegen Verwandtschaft als Ursache einer räumlichen Nähe. Die Bindung durch die chronologisch bedingten und zugleich stark normativen Inventargruppen als auch die von Helmut Spatz aufgezeigte räumliche

Tabelle 6. Distanzen der Delaunay-Triangulation zwischen verwandten Bestattungen und dem arithmetischen Mittel der übrigen Gräber. Um Kanteneffekte der Triangulation zu entfernen sind Distanzen über 26 m ausgeschlossen.

Grab A	Grab B	Verwandtschaft	Distanz (m)
124 (HkSt)	85 (HkSt)	1. Grades	24,16
96 (HkSt)	50 (HkSt)	1. Grades	7,68
96 (HkSt)	132 (HkSt)	1. Grades	26,60
76 (HkSt)	83 (HkSt)	1. Grades	5,27
50 (HkSt)	132 (HkSt)	1. Grades	33,48
38 (GG)	25 (GG)	2. Grades	15,84
44 (HkSt)	83 (HkSt)	2. Grades	15,42
116 (HkSt)	76 (HkSt)	2. Grades	24,42
nicht Grab A | B	nicht Grab B | A	Arithmetisches Mittel	5,84

Nähe aufgrund des Geschlechtes bleiben damit das bestimmende Element für die primäre Ordnung im Gräberfeld. Auffällig ist der große räumliche Abstand zwischen Hinkelstein und Großgartach, der sich nach der hier aufgezeigten Belegung aus einer initialen Flächenerschließung ergibt, sowie die geringfügig größere Nähe innerhalb der Geschlechter, insbesondere bei den Männern (Tabelle 7). Hierin deuten sich weitere soziale Bindungen an.

In seiner Habilitationsschrift benennt Johannes Müller die Prämissen, unter denen er die Beschreibung einer prähistorischen Sozialstruktur für möglich hält. Diese Voraussetzungen sind in mehrfacher Hinsicht anspruchsvoll: hinsichtlich der Quellen, der methodischen Voraussetzungen und der angewandten Analysen (Müller 2002, 51–55). Das Gräberfeld

*Tabelle 7. Mittlere Distanz der Delaunay-Triangulation zwischen Bestattungen der entsprechenden Paarungen (*vice versa*). **GG** Großgartach, **HkSt** Hinkelstein, **F** Frau, **M** Mann, **indet** unbestimmt (archäologische Geschlechtsbestimmung).*

Paarung	Anzahl	Mittlere Distanz (m)
GG - GG	111	6,1
GG - HkSt	44	7,1
HkSt - HkSt	204	4,3
F - F	71	5,0
F - M	170	5,4
M - M	74	4,8
indet - F	25	5,4
M - *indet*	16	5,1
indet - *indet*	3	5,6

von Trebur ist hier als Fallbeispiel sicherlich hervorragend geeignet. Und obwohl 25 Jahre seit der monographischen Vorlage durch Helmut Spatz vergangen sind, zahlreiche weitere Publikationen, u. a. die von Johannes, sich einzelnen Aspekten gewidmet haben, bleibt die gestellte Aufgabe einer „sozialchronologischen Studie" in Trebur eine bestehende Herausforderung. Wie gut, dass es noch viel zu tun gibt.

LITERATUR

Acsádi, G. und Neméskeri, J., 1970. *History of human lifespan and mortality*. Budapest: Akad. Kiadó.

Bronk Ramsey, C., 2021. *Oxford Radiocarbon Accelerator Unit* [online]. http://c14.arch.ox.ac.uk ; letzter Zugriff 14. April 2022

da Silva, N.A., Özer, O., Haller, M., Chen, Y.-R., Kolbe, D., Schade-Lindig, S., Wahl, J., Berszin, C., Francken, M., Görner, I., Schierhold, K., Pechtl, J., Grupe, G., Rinne, C., Müller, J., Lenz, T.L., Nebel, A. und Krause-Kyora, B., 2023. Admixture as a source for HLA variation in Neolithic European farming communities. *Genome Biology* 26(43), 1–23.

Dammers, B., 2003. Das Gräberfeld von Trebur. *In:* B. Heide, Hrsg. *Leben und Sterben in der Steinzeit. Ausstellung im Landesmuseum Mainz, 22. Juni–21. September 2003*. Mainz: Philipp von Zabern, 121–126.

Denaire, A., Lefranc, P., Wahl, J., Bronk Ramsey, C., Dunbar, E., Goslar, T., Bayliss, A., Beavan, N., Bickle, P. und Whittle, A., 2017. The Cultural Project: Formal Chronological Modelling of the Early and Middle Neolithic Sequence in Lower Alsace. *Journal of Archaeological Method and Theory* 24(4), 1072–1149.

Dürrwächter, C., Craig, O.E., Collins, M.J., Burger, J. und Alt, K.W., 2006. Beyond the grave: variability in Neolithic diets in Southern Germany? *Journal of Archaeological Science* 33(1), 39–48.

Dürrwächter, C., Craig, O.E., Tylor, G., Collins, M.J., Burger, J. und Alt, K.W., 2003. Ernährungsrekonstruktion in neolithischen Populationen anhand der Analyse stabiler Isotope: Trebur (HST/GG) und Herxheim (späte LBK). *Berichte der Kommission für Archäologische Landesforschung in Hessen* 7, 43–53.

Falkenstein, F., 2008. Geschlechterrollen und Sozialstatus im Spiegel der neolithischen Gräberfelder von Aiterhofen-Ödmühle und Trebur. *In:* F. Falkenstein, S. Schade-Lindig und A. Zeeb-Lanz, Hrsg. *Kumpf, Kalotte, Pfeilschaftglätter. Zwei Leben für die Archäologie. Gedenkschrift für Annemarie Häußer und Helmut Spatz*. Rahden/Westfalen: Verlag Marie Leidorf, 77–95.

Gleser, R., 2012. Zeitskalen, Stilistische Tendenzen und Regionalität des 5. Jahrtausends in den Altsiedellandschaften zwischen Mosel und Morava. *In:* R. Gleser und V. Becker, Hrsg. *Mitteleuropa im 5. Jahrtausend vor Christus: Beiträge zur Internationalen Konferenz in Münster 2010*. Berlin: LIT, 35–105.

Kromer, B., 1999. ^{14}C-Analysen der Knochenproben von Trebur, Kr. Groß-Gerau. *In: Spatz 1999*, 383–386.

Kunter, M., 2001. Beobachtungen zur Frage der Bevölkerungskontinuität an dem mittelneolithischen Gräberfeld von Trebur, Südhessen. *In:* A. Lippert, M. Schultz, S. Shennan und M. Teschler-Nicola, Hrsg. *Mensch und Umwelt während des Neolithikums und der Frühbronzezeit in Mitteleuropa: Ergebnisse interdisziplinärer Zusammenarbeit zwischen Archäologie, Klimatologie, Biologie und Medizin. Internationaler Workshop vom 9.–12. November 1995*. Rahden/Westfalen: Verlag Marie Leidorf, 203–206.

Lee, S. und Ramsey, C.B., 2012. Development and Application of the Trapezoidal Model for Archaeological Chronologies. *Radiocarbon* 54(1), 107–122.

Müller, J., 2002. Zur Belegungsabfolge des Gräberfeldes von Trebur: Argumente der typologieunabhängigen Datierungen. *Journal of Neolithic Archaeology* 4. Dieser Artikel erscheint ebenfalls: *Praehistorischen Zeitschrift* 77, 148–158. http://www.jna.uni-kiel.de/index.php/jna/article/view/79/80

Ramsey, C.B., Higham, T.F.G., Owen, D.C., Pike, A.W.G. und Hedges, R.E.M., 2002. Radiocarbon Dates from the Oxford AMS System: Archaeometry Datelist 31. *Archaeometry* 44(3) Suppl. 1, 1–150.

Reimer, P.J., Austin, W.EN., Bard, E., Bayliss, A., Blackwell, P.G., Ramsey, C.B., Butzin, M., Cheng, H., Edwards, R.L., Friedrich, M., Grootes, P.M., Guilderson, T.P., Hajdas, I., Heaton, T.J., Hogg, A.G., Hughen, K.A., Kromer, B., Manning, S.W., Muscheler, R., Palmer, J.G., Pearson, C., Plicht, J. van der, Reimer, R.W., Richards, D.A., Scott, E.M., Southon, J.R., Turney, C.SM., Wacker, L., Adolphi, F., Büntgen, U., Capano, M., Fahrni, S.M., Fogtmann-Schulz, A., Friedrich, R., Köhler, P., Kudsk, S., Miyake, F., Olsen, J., Reinig, F., Sakamoto, M., Sookdeo, A. und Talamo, S., 2020. The IntCal20 Northern Hemisphere Radiocarbon Age Calibration Curve (0–55 cal kBP). *Radiocarbon* 62(4), 725–757.

Spatz, H., 1996. *Beiträge zum Kulturenkomplex Hinkelstein – Großgartach – Rössen: Der keramische Fundstoff des Mittelneolithikums aus dem mittleren Neckarland und seine zeitliche Gliederung*. Stuttgart: Theiss.

Spatz, H., 1999. *Das mittelneolithische Gräberfeld von Trebur, Kreis Groß-Gerau*. Wiesbaden: Selbstverl. des Landesamtes für Denkmalpflege Hessen.

Spatz, H., 2001. Zur Verlässlichkeit von Knochendatierungen – Das Beispiel Trebur, Südhessen. *Preistoria Alpina* 37, 273–286.

Stöckli, W.E., 2002. *Absolute und relative Chronologie des Früh- und Mittelneolithikums in Westdeutschland (Rheinland und Rhein-Main-Gebiet)*. Basel: Archäologie Verlag.

Teegen, W.-R., Kreutz, K. und Kunter, M., 2003. Neue paläopathologische Beobachtungen an Skeletten aus dem mittelneolithischen Gräberfeld von Trebur (Ldkr. Groß-Gerau) – ein Vorbericht. *Beiträge zur Archäozoologie und prähistorischen Anthropologie* 4, 46–50.

CHAPTER 6

Bridging the Scales

Figure chapter 6: Idealised reconstruction of the landscape showing the changes from post-glacial tundra to a modern cultural landscape. In the background: Bruszczewo, Poland. Reconstruction of an early Bronze Age settlement c. *1780 cal BC (Drawing: Susanne Beyer; graphic: Petra Horstmann).*

Asymmetrische Feuersteinpfeilspitzen mit Gebrauchsglanz?
Zu einem Typ frühbronzezeitlicher Sicheleinsätze im Magdeburger Raum

Jonas Beran

KEYWORDS: *sickle, harvesting tools, flint inserts from wooden sickles, Late Neolithic, Early Bronze Age, Ammensleben Group, Únětice Culture, Central Germany*

Zusammenfassung

Unter den Lesefunden von endneolithischen und frühbronzezeitlichen Siedlungsplätzen im Magdeburger Raum fielen Feuerstein-Kleingeräte mit Flächen- oder zumindest seitlichen Flachretuschen auf, weitere fanden sich in älteren Sammlungsbeständen. In der Regel werden sie als Variante der ihnen in der Größe gleichenden herzförmigen Pfeilspitzen angesprochen und auch publiziert. Sie sind aber deutlich unsymmetrisch, einen auffällig großen und gekrümmten Widerhaken gibt es nur auf einer Seite, und auf dieser zeigt die Schneide einen kräftigen Gebrauchsglanz. Echte Pfeilspitzen haben auch oft einen aber eher flächigen leichten Gebrauchsglanz, der von der Reibung im Köcher herrühren könnte. Bei den fraglichen Stücken dürfte es sich um Schneideneinsätze von ähnlich den Flintschneidenschwertern konstruierten Sicheln handeln, die hier die großen Flintsicheln des nordischen Spätneolithikums vertreten. Neben der in den letzten Jahren verstärkten Erforschung der Aunjetitzer Mahlsteine gewinnen wir hier vielleicht einen weiteren Zugang zu Ackerbau und Ernährung bei Ammenslebener Gruppe, Glockenbecher-, Einzelgrab- und Aunjetitzer Kultur, vielleicht z. B. zur Lokalisierung von Anbauflächen.

Abstract

Among the stray finds from Final Neolithic and Early Bronze Age settlement sites in the Magdeburg area, small flint tools with flat or at least lateral flat retouches stood out; others were found in older collections. Usually, they are referred to and also published as variants of the heart-shaped arrowheads that resemble them in size. However, they are clearly asymmetrical, with a conspicuously large and curved barb on one side only, and on this side the cutting edge shows a strong sickle gloss. Genuine arrowheads also often have a rather full surface, light gloss, which could be caused by friction in the quiver. The pieces in question are probably blade inserts from sickles constructed in a similar way to flint-bladed swords, which here replace the large flint sickles of the Nordic Late Neolithic. In addition to the increased research into the Únětice grinding stones in recent years, we may gain further insights into agriculture and nutrition in the Ammensleben Group, Bell Beaker, Single Grave and Únětice Cultures, perhaps e.g. for the localisation of cultivation areas.

Entlang des in West-Ost-Richtung verlaufenden Tals des Flüsschens Schrote westlich von Magdeburg, in den Gemarkungen Magdeburg-Diesdorf und Niederndodeleben, ist eine Reihe von endneolithisch-frühbronzezeitlichen Siedlungsfundplätzen der Ammenslebener Gruppe und der Aunjetitzer Kultur bekannt, hauptsächlich durch Oberflächenabsammlungen von Verfasser und Wilfried Fricke in den 1970er und 1980er Jahren (Beran 1983; 1986; Fricke 2007). Auch einige etwas weiter landeinwärts liegende zugehörige Bestattungsplätze sind aus kleineren Notbergungen und Rettungsgrabungen bekannt (Beran 1989; Autze 2007; Meller und Schefzik 2020, 202 Nr. 36).

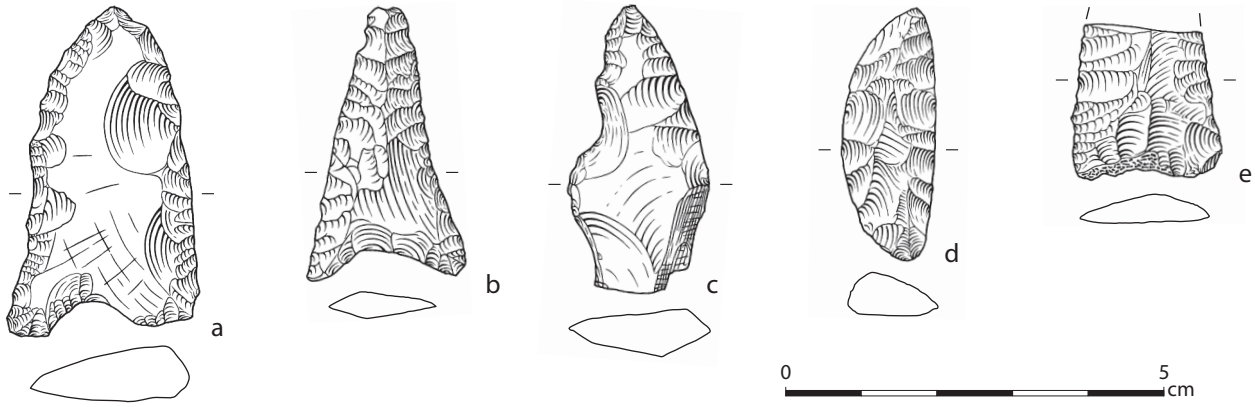

Abb. 1. Flint-Kleingeräte, Oberflächenfunde von Niederndodeleben 5, einem Siedlungsplatz der Ammenslebener Gruppe und frühen Aunjetitzer Kultur (Zeichnungen: Jonas Beran).

Unter den Flintartefakten des bisher fundreichsten Platzes (Niederndodeleben 5) gibt es ein Dolchbruchstück und Pfeilspitzen. Ein kleines Flintgerät (Abb. 1d) entsprach nach dem Umriss und der beidseitigen vollständigen Flächenretusche den „halbmondförmigen" Flintsicheln des norddeutsch-skandinavischen Spätneolithikums (Kühn 1979, 64–67; Weller 2022, 122–124), war aber mit 3,4 cm Länge viel kleiner. Ein deutlicher Gebrauchsglanz ist auch nicht zu erkennen.

Einige andere Stücke (Abb. 1 a–c) entsprechen in der Größe den endneolithisch-frühbronzezeitlichen Pfeilspitzen, etwa den sogenannten herzförmigen der Glockenbecher- und Aunjetitzer Kultur oder den rhombischen oder lanzettförmigen der Ammenslebener Gruppe und der Einzelgrabkultur (Beran 1990; Bertram 2004; Fricke 2007, 58 Abb. 3). Üblicherweise spricht man solche Stücke als unfertige oder misslungene oder beschädigte Pfeilspitzen an. Solche gibt es ja, vergleiche z. B. François Bertemes (2020, 134 Abb. 5). Beispielsweise kann ein unsymmetrischer Umriss durch Abbrechen eines Widerhakens entstehen. Abweichungen von der Idealform können auch materialbedingt sein.

Viele gute Pfeilspitzen weisen einen leichten, politurartigen Gebrauchsglanz auf (z. B. das Stück Abb. 1 e), der schon bei der Herstellung entstanden sein kann oder wohl vor allem auf die Reibung beim längeren Transport im Köcher zurück zu führen ist. Bei den hier vorliegenden asymmetrischen und minderwertig wirkenden „Pfeilspitzen" fielen aber auf der längeren Seite eine deutliche Kantenverrundung und ein sehr starker, sichelartiger Glanz („Lackglanz") auf. Dies ließ eher vermuten, dass es sich um Einsatzstücke bzw. Klingen von Schneidegeräten handeln könnte. Eine Verwendung als Messerklinge erscheint angesichts der geringen Länge nicht so praktikabel. Am plausibelsten ist wohl eine Interpretation als hintereinander in gebogene Holzschäfte eingeklebte Sichelschneiden-Stücke analog den Sichel-Einsatzklingen von meist rechteckigem Umriss der alt- bis spätneolithischen Kulturen des 6. bis 4. Jahrtausends v. Chr. (Schlichtherle 1992, 29 Abb. 5; Karamali 2010, 162 Abb. 3), wobei der widerhakenartige Dorn die Spitze des folgenden Stückes etwas überdeckt und so ein Herausreißen und Herausfallen erschwert. Entsprechend der anderen Flinttechnik des ausgehenden Neolithikums sind es jetzt nicht mehr Abschnitte regelmäßiger, im Umriss rechteckiger Klingen, sondern sie wurden aus unregelmäßigen, etwas dickeren Abschlägen gefertigt (vgl. Karamali 2010, 162 Abb. 4). Als Schneide dient dann nicht die primäre gerade Klingenkante, sondern die dann leicht sägeartige Sichelschneide wird durch beidseitige, mehr oder weniger in die Fläche übergehende Flachretuschen erzeugt.

Der technologisch-typologische Unterschied ist damit derselbe wie zwischen den Flint-Klingendolchen oder Spandolchen der Schnurkeramik, Einzelgrabkultur und Glockenbecherkultur und den durch Schliff und Flachretuschen geformten „Kerndolchen" des nordischen Spätneolithikums und der Aunjetitzer Kultur.

Die Zusammenstellung einer größeren Zahl solcher in Flintdolchtechnik hergestellten Einsatzstücke auf einem tragenden und verbindenden Holzschaft (vgl. Schlichtherle 1992, 25 Abb. 1; 29 Abb. 5; 31 Abb. 6; Weller 2022, 119) entspräche den selten nachgewiesenen, nie in kompletter Erhaltung gefundenen aber doch anhand von Grabfunden plausibel rekonstruierten Flintschneidenschwertern (Strahl 1987; Hirsch 2010) und Flintschneidendolchen (Škrdla und Šebela 1997).

Der beschriebene Typ von möglichen Einsatzstücken „dolchzeitlicher Flintschneidensicheln" scheint in vielen mitteldeutschen Oberflächenfund-Konvoluten vertreten zu sein, einiges fiel als Beifang bei der Suche nach anderen Dingen in Museen in Sachsen-Anhalt und in Thüringen auf. Seine vorläufige Benennung nach zwei besonders charakteristischen Exemplaren vom Fundort Jersleben sei hier vorgeschlagen.

Die davon deutlich verschiedenen halbmondförmigen Miniatursicheln könnte man erst einmal als Typ Niederndodeleben ansprechen. Vergleichbare halbmondförmige flächenretuschierte Flintstücke gibt es in der nordgriechischen Frühbronzezeit (Kourtessi-Philippakis 2010, Abb. 2.1, 2).

Zur Datierung geeignete eindeutige Fundzusammenhänge sind mir aus dem mittel- und ostdeutschen Raum nicht bekannt. Meist ist bei den wenigen mit Abbildung publizierten Verdachtsstücken nicht klar, ob das entscheidend definierende Merkmal des einseitigen starken Gebrauchsglanzes vorliegt oder nicht und es sich dann eben doch eher um eine Pfeilspitze handelt. Zu nennen wäre z. B. ein Stück aus einem gestörten Grab der Hochstufe der Oderschnurkeramik von Schönow in der brandenburgischen Uckermark (Probst und Wetzel 1972, 116 Abb. 4 a).

Auch die Flintpfeilspitzen aus Gräbern der Baalberger Kultur und älteren Trichterbecherkultur sind angesichts oft im Unterschied zu den endneolithischen mangelnder Symmetrie und größerflächiger Retusche Verwechslungskandidaten (Pöller 1980, 120 Abb. 3 b; Böttcher 1982, 168 Abb. 3 a-d, f).

Die wenigen vor längerer Zeit beiläufig registrierten Exemplare der vermutlich endneolithisch-frühbronzezeitlichen Flint-Kleingeräte der Typen Jersleben und Niederndodeleben sollen hier erst einmal vorgelegt und ein Deutungsversuch zur Diskussion gestellt werden. Dies in der Annahme und Hoffnung, dass es viel mehr davon gibt und in den Altsammlungen und neuen Grabungsfunden ermittelt und bekannt gemacht werden kann, um sie in der Folge auch für siedlungs- und wirtschaftsgeschichtliche Fragen nutzen zu können.

LITERATUR

Autze, T., 2007. Zwei neue absolute Daten für die frühe Aunjetitzer Kultur – Ausgrabungen an der Schrotetalbrücke bei Niederndodeleben, Ohrekreis. *Archäologie in Sachsen-Anhalt* 4(1), 94–101.

Beran, J., 1983. Eine Siedlungsstelle der späten Jungsteinzeit bei Niederndodeleben. *Jahresheft des Kreismuseums Wolmirstedt*, 15–19.

Beran, J., 1986. Eine Siedlungsgrube der Ammenslebener Gruppe von Niederndodeleben, Kr. Wolmirstedt. *Ausgrabungen und Funde* 31, 160–164.

Beran, J., 1989. Zur Spätphase der Ammenslebener Gruppe im Magdeburger Raum. *Ausgrabungen und Funde* 34, 172–175.

Beran, J., 1990. *Funde der Einzelgrabkultur im Bezirk Magdeburg. Neolithische Studien 4*, Wissenschaftliche Beiträge der Martin-Luther-Universität Halle-Wittenberg 6. Haale-Saale: Martin Luther Universität.

Bertemes, F., 2020. Das Ringheiligtum von Pömmelte – Kreise für die Ewigkeit. *In: Meller und Schefzik 2020*, 131–135.

Bertram, J.-K., 2004. Pfeil und Bogen im mitteldeutschen/altmärkischen Endneolithikum und in der Frühbronzezeit (Schnurkeramik, Glockenbecherkultur, Aunjetitzer Kultur). Ein erster Vorbericht. *In:* H.-J. Beier und R. Einicke, Hrsg. *Varia neolithica III,* BUFM 37. Langenweißbach: Beier & Beran, 137–159.

Böttcher, G., 1982. Ein Grab der Baalberger Gruppe mit Kupferschmuck von Büden, Kr. Burg. *Ausgrabungen und Funde* 27, 165–170.

Eriksen, B.V., Hrsg., 2010. *Lithic technology in metal using societies. Proceedings of a UISPP Workshop, Lisbon, September 2006*, Jutland Archaeological Society Publications 67. Aarhus: Aarhus University Press.

Fricke, W., 2007. Wiederbesiedlung nach 4500 Jahren – ein Fundplatz der Schönfelder Kultur im Neubaugebiet »An der Röthen« in Magdeburg-Olvenstedt. *Archäologie in Sachsen-Anhalt* 4(1), 58–62.

Hirsch, K., 2010. Neu identifizierte Bestandteile von Flintschneidenschwertern aus Sønderjylland. *Arkæologi i Slesvig. Archäologie in Schleswig* 13, 57–61.

Karimali, E., 2010. Lithic and metal tools in the Bronze Age Aegean: A parallel relationship. *In: Eriksen 2010*, 157–167.

Kourtessi-Philippakis, G., 2010. Bronze Age lithic production in Northern Greece. The evidence from settlements. *In: Eriksen 2010*, 169–182.

Kühn, H.J., 1979. *Das Spätneolithikum in Schleswig-Holstein*, Offa-Bücher 40. Neumünster: Wachholtz.

Meller, H. und Schefzik, M., Hrsg., 2020. *Die Welt der Himmelscheibe von Nebra – Neue Horizonte. Begleitband zur Ausstellung im Landesmuseum für Vorgeschichte Halle (Saale) 4. Juni 2021 bis 9. Januar 2022*. Darmstadt: wbg THEISS.

Pöller, H., 1980. Eine Bestattung der Baalberger Gruppe von Neuenfeld, Kr. Prenzlau. *Ausgrabungen und Funde* 25, 118–122.

Probst, R. und Wetzel, G., 1972. Bestattungen der Oderschnurkeramik von Schönow, Kr. Angermünde. *Ausgrabungen und Funde* 17, 112–117.

Schlichtherle, H., 1992. Jungsteinzeitliche Erntegeräte am Bodensee. *Plattform* 1/1992, 24–44.

Škrdla, P. und Šebela, L., 1997. Pozdně eneolitické složené dýky na Moravě. *Přehled výzkumů* 57(1), 1993–1994, 77–86.

Strahl, E., 1987. Frühbronzezeitliche Schwerter mit Flintschneide im Elb-Weser-Dreieck. *Die Kunde N.F.* 38, 67–72.

Weller, U., 2022. *Messer und Erntegeräte: Erkennen, bestimmen, beschreiben. Mit einem Beitrag von R. Heynowski*, Bestimmungsbuch Archäologie 8. Berlin: Deutscher Kunstverlag.

KATALOG

Sachsen-Anhalt

Eilsleben, Lkr. Börde
Fpl. Voßwelle
Sicheleinsatz Typ Jersleben mit einseitigem Sichelglanz; L 5,8 cm, gB 2,3 cm.
Landesmuseum Halle HK 79:1143 i.

Hadmersleben, OT von Oschersleben (Bode), Lkr. Börde
Fpl. Hochufer der Bode, Lesefund Fred Timm 2024
Kleine halbmondförmige Flintsichel mit seitlichen Flachretuschen, Typ Niederndodeleben, Schneiden bzw. Kanten kaum verrundet, kein Gebrauchsglanz. L 4,95 cm, gB 2,1 cm, gD 0,85 cm. F hell gelblichgrau, durchscheinend (Abb. 2).
Landesmuseum Halle.

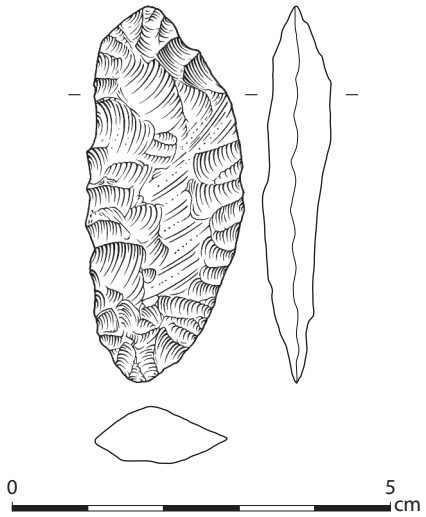

Abb. 2. Miniatur-Flintsichel von Hadmersleben (Zeichnung: Jonas Beran).

Jersleben, Einheitsgemeinde Niedere Börde, Lkr. Börde
Fpl. u., Lesefunde Hermann Künne. Archiv Halle Ortsakte Blatt 59, Fundmeldung Ernst Niemann.
Sicheleinsatz Typ Jersleben. L 3,6 cm, gB 1,9 cm (Abb. 3b).
Museum Salzwedel V 6778 a.
Sicheleinsatz Typ Jersleben, Spitze beschädigt. L noch 3,7 cm, gB 1,8 cm (Abb. 3a).
Museum Salzwedel V 6778 b.

Löderburg, OT von Staßfurt, Salzlandkreis
Fpl. 2, Hangelberg
Kleine flächenretuschierte Sichel Typ Niederndodeleben, L 3,9 cm.
Museum Schönebeck 1096.

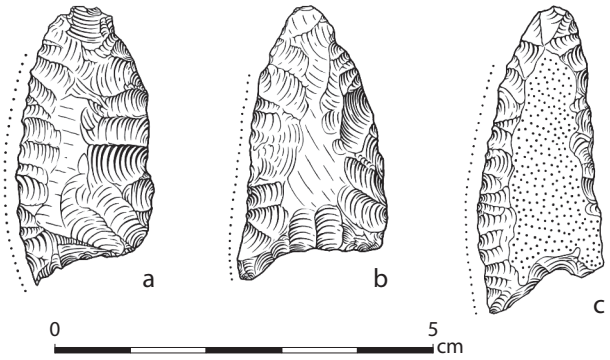

*Abb. 3. Flintsichel-Einsatzstücke mit starkem Lackglanz (**Punktlinien**) von Jersleben **(a–b)** und von unbekanntem Fundort (c) im Museum Halberstadt (Zeichnungen: Jonas Beran).*

Magdeburg-Diesdorf
Fpl. 9, Lesefund J. Beran 23.12.1983
Sicheleinsatz Typ Jersleben, L 3,3 cm.
Museum Magdeburg.

Niederndodeleben, Gemeinde Hohe Börde, Lkr. Börde
Fpl. 5. Lesefunde J. Beran auf Siedlungsstelle der Ammenslebener Gruppe und wohl frühen Aunjetitzer Kultur.
Drei pfeilspitzenartige Flintgeräte mit Flachretuschen und Sichelglanz (Abb. 1a–c), eine Miniatursichel bzw. Sicheleinsatz, beidseitig flächenretuschiert. L 3,4 cm, gB 1,2 cm, gD 0,6 cm (Abb. 1d), eine beschädigte herzförmige Pfeilspitze mit leichtem Abriebglanz (Abb. 1e).
Museum Magdeburg 85:1–13.
Beran 1986, Abb. 1.

Unseburg, OT der Gemeinde Bördeaue, Salzlandkreis
Fpl. Weinberg
Kleine flächenretuschierte Sichel Typ Niederndodeleben, L 4,9 cm.
Museum Schönebeck 1099 d.

Fpl. Weinberg, Grabungsfund 8. 7. 1988, Qu. 596, 3. Abbaulage
Größerer Sicheleinsatz ähnlich Typ Jersleben, aus unregelmäßigem breiten Abschlag, auf Rückseite abgerollte, patinierte Knollenoberfläche. L 5,6 cm, gB 2,4 cm, gD 0,6 cm (Abb. 4).
Landesmuseum Halle.

Werschen, OT von Hohenmölsen, OT Oberwerschen
Fpl. Grabung 1935, Grab 1.
Langdreieckig asymmetrisches Flintgerät mit beidseitiger totaler Flächenretusche und starkem Gebrauchsglanz auf der längeren Seite, Typ Jersleben,

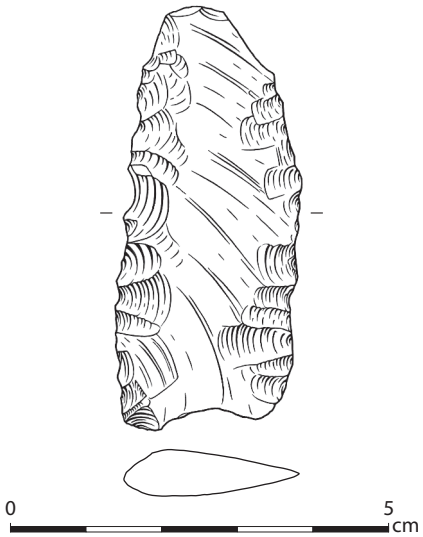

Abb. 4. Sichel-Schneideneinsatz von Unseburg (Zeichnung: Jonas Beran).

L 3,1 cm, gB 1,2 cm, gD 0,4 cm.
Landesmuseum Halle 60:90 c.

Wolmirsleben, Verbandsgemeinde Egelner Mulde, Salzlandkreis
Fpl. 7, Saueranger.
Sicheleinsatz Typ Jersleben.
Museum Egeln. Archiv Halle OA Bl. 116.

Fundort unbekannt.
Sicheleinsatz Typ Jersleben, großflächig erhaltene Cortex. L 4,1 cm, gB 1,6 cm (Abb. 3c).
Museum Halberstadt.

Thüringen

Gräfentonna, Ortsteil von Tonna, Lkr. Gotha
Fpl. Lohberg
Langrechteckiges Flintgerät mit vollständiger Flächenretusche und einseitigem starken Gebrauchsglanz. L 3,9 cm, gB 1,5 cm.
Museum Gotha 1984:41
Dreieckiges Flintgerät mit flachen Kantenretuschen und einseitigem starken Gebrauchsglanz. L 3,3 cm, gB 1,5 cm.
Museum Gotha 1984:43
Drei Sicheleinsätze Typ Jersleben.
Museum Weimar L. G. 2050; 2079; 6623, in Sammelkiste 1923/75.

Ottstedt am Berge, OT von Grammetal, Lkr. Weimarer Land
Kleine flächenretuschierte Flintsichel mit Lackglanz.
Museum Weimar.

Schinditz, OT von Dornburg-Camburg, Saale-Holzland-Kreis.
Sicheleinsatz Typ Jersleben, dreieckig, aus dickem Abschlag, eine Seite mit Flachretusche und Lackglanz, Dorn abgebrochen, die andere Seite mit Steilretusche.
L noch 2,5 cm, gB 1,4 cm, gD 0,6 cm.
Friedrich-Schiller-Universität Jena, Sammlung Heim.
In Karton mit Feuersteinen, darunter mehrere Klingenstücke mit Glanz.

Vierzehnheiligen, OT der kreisfreien Stadt Jena
Sicheleinsatz Typ Jersleben.
Museum Weimar 275/75.

Perfectly Polished
A Multifaceted Grinding or Polishing Stone from Schleswig-Holstein with Scandinavian Connections

Sönke Hartz, Hauke Jürgens, Sebastian Schultrich

KEYWORDS: *faceted polishing stones, battle axes, Corded Ware, pecking technique, trace-use analysis*

Zusammenfassung

Steinäxte, Keulen und Hämmer aus dem Mittel- und Jungneolithikum (ca. 3300–2200 v. Chr.) wurden nach dem Picken geschliffen oder poliert. Allerdings gibt es kaum archäologische Belege dafür, wie und mit welchen Werkzeugen diese Oberflächenbehandlung durchgeführt wurde. Ein einzigartiger facettierter Schleif- oder Polierstein aus Schleswig-Holstein, der schon am Ende des 19. Jahrhunderts in die Kieler Museumskollektion gelangte, könnte Hinweise auf die Oberflächenbehandlung von Felsgesteinsgeräten geben. Darüber hinaus zeigt er Parallelen zu skandinavischen multifacettierten Schleifsteinen, die dort aus schnur- und grübchenkeramischen Fundkontexten bekannt sind.

Abstract

Stone battle axes, clubs and hammers from the Middle and Younger Neolithic (c. 3300–2200 BCE) were ground or polished after pecking, but there is little evidence in the archaeological record of how and with what tool this surface treatment was carried out. A unique faceted polishing stone from Schleswig-Holstein, which was added to the collection of the Kiel Museum at the end of the 19th century, may provide clues to the surface treatment of stone tools. It also shows parallels with Scandinavian multifaceted polishing stones known from Corded Ware and Pitted Ware contexts.

EINLEITUNG

Arbeitsgeräte zum Schleifen und Polieren führen in steinzeitlichen Fundinventaren ein verborgenes Dasein. In der älteren und mittleren nordischen Steinzeit war das großflächige Schleifen von Stein weitgehend unbekannt, allerdings wurden bereits in der späten Mittelsteinzeit Walzenbeile und Spitzhauen aus Felsgestein oberflächlich und an der Schneide partiell geschliffen.

Mit dem Beginn des nordischen Frühneolithikums [EN] (frühe Trichterbecherkultur [TBK], EN Ia/Ib, 4000–3500 cal BC) werden erstmals Steinbeilklingen einem aufwendigen Schleifvorgang unterzogen, darunter hauptsächlich die spitznackigen und dünnnackigen Flintbeilklingen, aber auch Beilklingen und Streitäxte aus Felsgestein. Bei den Flintbeilklingen wurde nach dem Zurichten des Halbfabrikats zunächst der Beilkörper überschliffen und im letzten Arbeitsgang die bruchempfindliche Schneide messerscharf poliert (Hein und Lund 2017, 135). Als Arbeitsmittel dienten Schleifwannen aus Sandstein oder quarzitischem Sandstein, die nur selten als vollständige Exemplare überliefert sind. Es gibt Hinweise darauf, dass sie nach dem Gebrauch intentionell zerschlagen (Hoika 1987) und zusammen mit den Siedlungsabfällen entsorgt wurden. Die unspektakulären Fragmente sind deshalb kaum Forschungsgegenstand intensiver Analysen. Im Jungneolithikum (Schnurkeramik [SK] / Einzelgrabkultur [EGK]) verloren Symmetrie und Vollschliff der Flintbeilklingen insbesondere in der Spätphase (Jungneolithikum II) an Bedeutung (Struve 1955; Højlund 1973/74; Petersen 1993; Hübner 2005). In dieser Periode nahm die Produktion und Variationsbreite von

Felsgesteinsäxten (Streitäxte) aufgrund gesellschaftlicher Differenzierungen hin zu komplexeren Sozialgefügen zu, was im Norden zu Bezeichnungen wie Streitaxtkultur/*Stridsøksekultur*/Bootsaxtkultur (BAC, 2800–23/2250 cal BC) führte. Die Äxte wurden sorgfältig aus zähen Geschieben wie Diabasen, Amphiboliten oder Dioriten herausgepickt, dann durchlocht und abschließend zum Fertigprodukt geschliffen und poliert. Das Polieren bezog sich meistens auf das „finishing" der Äxte, d. h. auf die Schneiden- oder Nackenbereiche. Hierfür spricht der Umstand, dass die Ober- und Unterseiten häufig weniger geglättet sind und teilweise noch Reste des Pickvorgangs aufweisen. Streitäxte, insbesondere die elaborierten Formen, waren exklusive Statussymbole und finden sich neben der Bogenwaffe standardmäßig in den Einzelgräbern der namengebenden Einzelgrabkultur (Hübner 2005). Auch in Deponierungen sind sie nachgewiesen, während sie in Siedlungsinventaren meist als Fragmente anzutreffen sind (Karsten 1994; Schultrich 2018).

Die Herstellungsmethoden und das Schleifen von vierseitigen Flintbeilklingen sind durch archäologische Funde (Clausen 1989; Haßmann 2000; Hansen und Madsen 1983) und aktualistische Versuche weitgehend geklärt (Madsen 1984; Harding 1987; Weiner 2012b; Hein und Lund 2017). Dies gilt offensichtlich nicht für die Oberflächenbehandlung von Felsgesteinsgeräten wie Streitäxten und Keulen. Ein außergewöhnlicher, allerdings fundortloser Schleif- oder Polierstein aus Schleswig-Holstein, der sich seit dem Bestehen der archäologischen Kieler Sammlung am Ende des 19. Jh. in der Kollektion des `Museums für nordische Alterthümer` (heute Museum für Archäologie/ MfA Schleswig) befindet, soll hier vorgestellt und mit der Oberflächenbearbeitung von Felsgesteinsgeräten in Verbindung gebracht werden. Die einzigen belastbaren Parallelen zum schleswig-holsteinischen Fundstück sind die multifacettierten Schleifsteine aus Teilen Schwedens, Südnorwegens und von Bornholm, erstmals ausführlicher vorgestellt und untergliedert von Mats Malmer (1962). In seinen Untersuchungen zu den skandinavischen Stücken geht er davon aus, dass hauptsächlich jungneolithische Streitaxttypen wie z. B. die konvexe Oberseite der Bootäxte oder die komplexen aus Graten, Leisten und Knäufen bestehende Axtoberflächen auf facettierten Schleifsteinen hergestellt wurden. Unterstützt werden seine Annahmen durch Gräber, in denen Streitäxte und facettierte Schleifsteine als Beigaben zusammen auftreten.

QUARZIT UND SANDSTEIN: ROHMATERIALIEN FÜR STEINZEITLICHE SCHLEIFSTEINE

Im Steinzeitmagazin des Museums für Archäologie in Schleswig lagert ein kleines Kontingent von einfach facettierten Handschleifsteinen (Lindström und Patriksdotter 2020) aus jungsteinzeitlichen Fundkontexten, die aus Quarzit oder aus feinkörnigem Sandstein bestehen. Beide Materialien, aber insbesondere der harte Quarzit, scheinen zum Schleifen und Polieren von Stein hervorragend geeignet zu sein. Quarzit ist ein metamorphes Gestein mit einem mineralischen Hauptbestandteil von > 80 Vol. % Quarz. Es entsteht bei tektonischen Prozessen unter hohen Druck- und Temperaturverhältnissen und mechanischen Belastungen aus der Umwandlung anderer quarzhaltiger Gesteine wie z. B. Sandstein oder Kieselschiefer (Bräunlich 2021). Quarzit ist feinkörnig und entsprechend des Metamorphosegrades massig oder spröde und ohne Porenräume. Er besteht aus kristallisiertem Quarz ohne einzelne runde Körner. Quarzit ist sehr verwitterungsbeständig und extrem unempfindlich gegen jegliche Art von Umwelteinflüssen.

In Norddeutschland bilden Quarzite häufig Komponenten eiszeitlicher Moränenablagerungen (Rudolph 2017). Weit verbreitet ist eine weißliche oder hellgraue Varietät. Man findet sie im Jungmoränengebiet z. B. in den großen Steinhaufen an den Feldrainen oder als aus dem Geschiebemergel ausgewaschenes Geröll an den Stränden der Ostsee. In den Brandungszonen sind die Knollengrößen allerdings meist gering (< 0,50 m im Durchmesser), durch Abrollung sind an der Oberfläche häufig glatte Verwitterungsrinden ausgebildet.

Aufgrund seiner Materialbeschaffenheit bringt das Gestein zur Fertigung von Schleifsteinen also beste Voraussetzungen mit. Im frischen Bruch ist Quarzit rau und zeigt nicht den glatten, muscheligen Bruch wie der Feuerstein. Er lässt sich zwar mit dem harten Schlag bearbeiten, aber nur schwer für eine serielle Klingenproduktion nutzen. Dort wo Feuerstein in der Steinzeit nicht oder nur in schlechter Qualität verfügbar war, wurde dieses Gestein als Feuersteinersatz verwendet und zur Herstellung von Werkzeugen zugeschlagen (Floss 2012a).

Im Gegensatz zum Quarzit ist Sandstein ein Sedimentgestein aus miteinander verkitteten Quarzkörnern, die im frischen Bruch eine runde Form aufweisen. Die Verkittung entsteht durch Verfüllung der Zwischenräume zwischen den Körnern mit einem Bindemittel wie z. B. Ton- oder Eisenminerale oder gelöstem und wieder ausgefälltem Quarz. Beim quarzitischen Sandstein werden die Sandkörner ohne Bindemittel durch tektonische Vorgänge unter hohem Druck zusammengepresst.

Abb. 1. Seitenansichten des fundortlosen multifacettierten Schleif-/Poliersteins aus Schleswig-Holstein (Foto: Claudia Janke).

Im Neolithikum wurde quarzitischer Sandstein bevorzugt als Ausgangsmaterial für Mahl- und Klopfsteine verwendet (Kegler-Graiewski 2012; Weiner 2012a). Demgegenüber bilden die feinkörnigen Sandsteinvarianten den Rohstoff für Handschleifsteine und Schleifwannen, auf denen z. B. Flintbeilklingen geschliffen wurden (Brozio 2016).

BESCHREIBUNG DES FUNDSTÜCKES

Bei dem Fundstück handelt sich um einen 305 mm langen, mehrfach facettierten Schleif- oder Polierstein aus feinkörnigem, sehr hartem Quarzit mit einem Gewicht von 5270 Gramm. Der maximale Durchmesser von 114 mm liegt nicht in der Mitte, sondern etwa bei einem Drittel (Abb. 1). Das Gerät hat eine grob tonnenförmige Form und verjüngt sich an den Enden. Die beiden Stirnseiten sind im Querschnitt 62 x 52 mm und 65 x 60 mm groß und spiegelsymmetrisch im Winkel von 75° zur Längsachse geneigt. Die natürlichen Spaltflächen des Gerölles sind nur auf den beiden Stirnseiten erhalten geblieben, an deren Ränder sich Pick– bzw. Schlagmarken ringförmig anordnen (Abb. 2.1–2). Sie stammen offensichtlich aus der primären Herstellungsphase des Gerölls. Zwischen den im Profil konkaven Facetten sind an drei Stellen schwach konvexe Restoberflächen der Ausgangsform erhalten geblieben. Über diese Oberflächen sind die Grundform und der Querschnitt des Gerätes vor der Anlage der Facetten eindeutig bestimmbar. Demnach besaß es zunächst

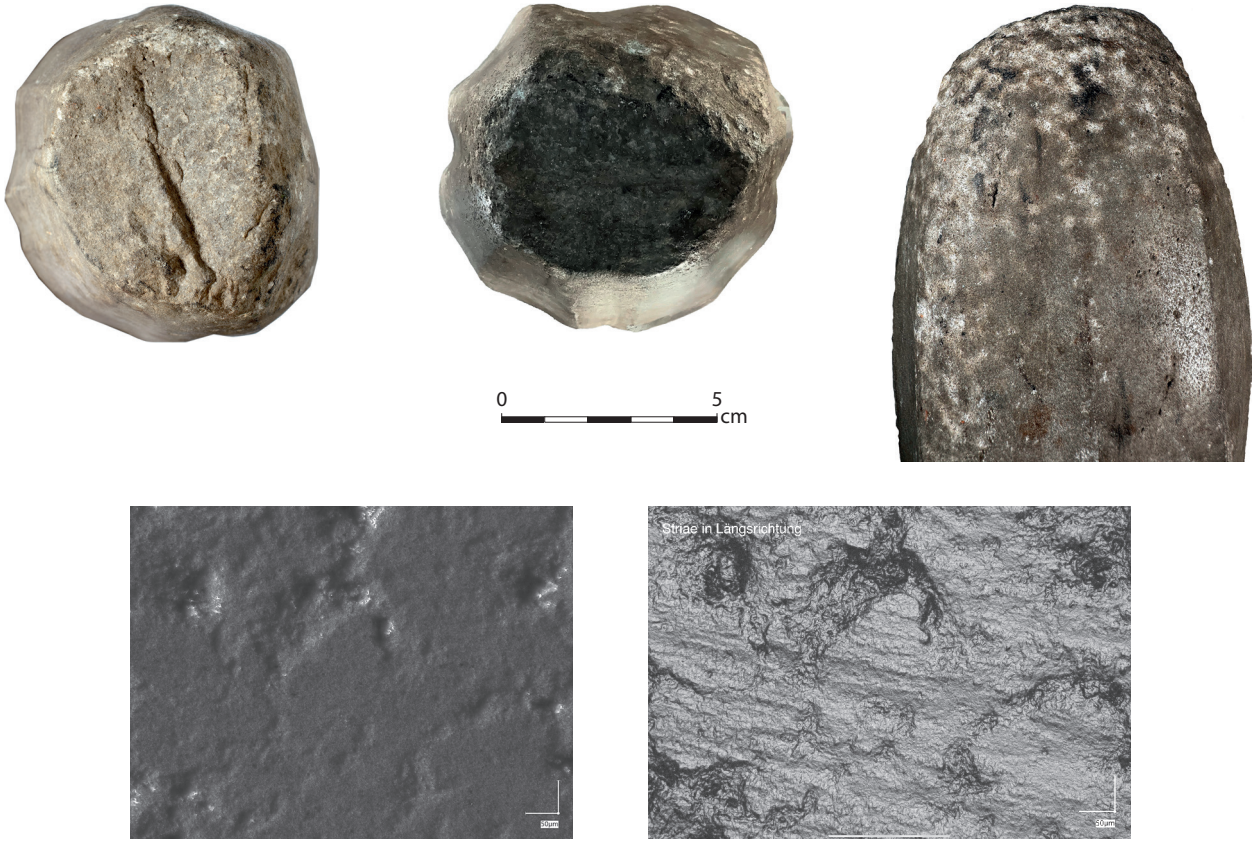

Abb. 2. ***1–2*** *natürliche Stirnfläche mit umlaufenden Pick- oder Schlagspuren;* ***3*** *Pickspuren an einem Ende des Poliersteins;* ***4*** *Kleine Löcher (pits) in der Facettenoberfläche;* ***5*** *lineare Arbeitsspuren (Striae) in Längsrichtung (Fotos:* ***1–3*** *Claudia Janke;* ***4–5*** *Hauke Jürgens).*

eine längliche Form mit rundlich- ovalem Querschnitt. Aufgrund der Lage und Erhaltung der noch vorhandenen Pickmarken (Abb. 2.3) ist davon auszugehen, dass die tonnenförmige Form zunächst durch grobes Picken vorbereitet und anschließend die Facetten angeschliffen wurden.

Die Oberfläche des Werkzeugs ist durch neun konturierte, glatte Facetten gegliedert (Abb. 1, Abb. 2.2), die in Längsrichtung schwach konvex verlaufen teilweise seidenmatt glänzen. Die Entstehung der Glanzphänomene ist durch Schleifen allein nicht zu erklären, da sich auf Quarzitoberflächen bei flächigem Schleifen erfahrungsgemäß eine matte Oberfläche ausbildet. Nur beim Polieren, d. h. durch minimalisierten Materialabrieb am Werkstück, entsteht der seidenmatte Glanz. Das Gerät wurde also zumindest im letzten Arbeitsgang als Polierstein genutzt, es soll deshalb im weiteren Textverlauf von einem solchen gesprochen werden. Die für Schleif- und Polierzwecke genutzten Bereiche der Facetten zeigen makro- und mikroskopisch einen unterschiedlichen Glanzgrad, der von matt (Abb. 3.2) bis seidenmatt glänzend (Abb. 3.1) reicht. Es überrascht, dass sich der variable Glanzgrad kleinflächig zufällig über alle Facetten zu verteilen scheint und weder möglichen Funktionsbereichen noch einzelnen Profilen der Facetten (schwach konvex, konkav) zuordnen lässt. Einzig eine *ca.* 15 mm breite singuläre U- bis halbkreisförmige Facette ist auf der gesamten Länge seidenmatt glänzend und damit offensichtlich zum Polieren genutzt worden. Bei hoher Vergrößerung auf allen Facetten in unterschiedlicher Intensität sichtbare zarte *Striae* weisen auf eine Bewegung des Werkstückes in Richtung der Längsachse des Poliersteines hin (Abb. 2.5). Unter Vergrößerung sind auf allen Facetten winzige Löcher (*pits*) zu erkennen (Abb. 2.4), die vermutlich als Materialausbrüche beim Polieren in Verbindung mit Wasser entstanden sind. Über die Nutzung eines Schleifmittels kann nur spekuliert werden, da die *Striae* auch durch Materialausbrüche aus der Oberfläche des Poliersteines entstanden sein können. In der dreidimensionalen mikroskopischen Darstellung wird die variable Rauigkeit der zum Schleifen und Polieren genutzten Flächen im Vergleich zu den gepickten Bereichen (Abb. 3.3) und Naturflächen (Abb. 3.4) deutlich. Makroskopisch weist keine Facette eindeutige Pickspuren auf, allerdings ist davon auszugehen, dass die Bahnen vor einem Schleifvorgang aufgeraut werden mussten, sollte das Stück anfangs als Schleifstein benutzt worden sein.

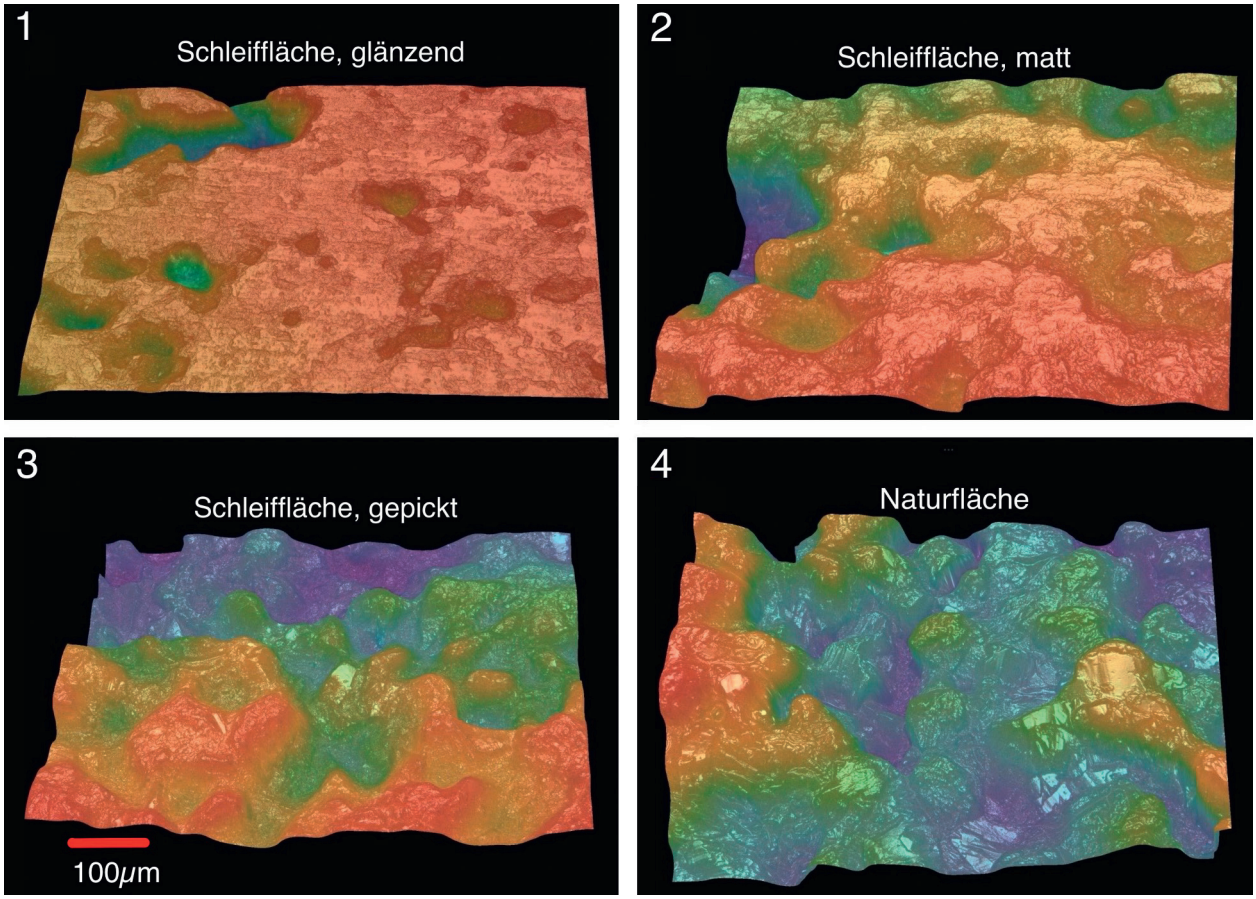

Abb. 3. 3-D-Darstellungen unterschiedlicher Oberflächenstrukturen in 300-facher Vergrößerung (Fotos: Hauke Jürgens).

Die Facetten sind im Profil schwach konkav oder gerade und zwischen 24 und 32 mm breit, an den Enden laufen sie spitzoval aus. An den Übergängen zwischen den Facetten sind abgerundete Grate ausgebildet. An einigen Stellen ist die Gesteinsoberfläche durch frische Kritzungen leicht beschädigt worden, was vermutlich auf die Lagerungsbedingungen oder den Kontakt mit landwirtschaftlichen Maschinen (Pflugschare, Eggenzähne) zurückzuführen ist. Eine sichere Abgrenzung zu Resten von Pickspuren ist nicht immer möglich.

Auf der Gesteinsoberfläche treten fünf verschiedenfarbige, sich teils überlappende Anhaftungen in den Farben Weiß, Blau, Orange, Schwarz und Braun auf. Die Farbreste haften überwiegend auf den Graten und dürften modernen Ursprungs sein. Ungewöhnlich für einen Schleif- oder Polierstein ist die tonnenförmige Wölbung der Geräteoberfläche in Längsrichtung, da sich Schleifsteine bekanntermaßen durch konkave bis stark konkave Schliffflächen auszeichnen. Von Bedeutung ist, dass die Facetten an beiden Geräteenden die gepickte Oberfläche überlagern, so dass die Narbenfelder nicht beim Gebrauch des Steins als Schlaginstrument (z. B. Hammerstein) entstanden sein können (Abb. 2.3). In vier der neun Facetten sind in einem späteren Arbeitsgang Rillen mit U- oder V-förmigem Profil eingearbeitet worden, die einen Winkel von *ca.* 120 Grad ausbilden. Diese Rillen verlaufen in Längsrichtung plan, ganz offensichtlich wurden dort Polierarbeiten durchgeführt, die funktional nicht mit der Entstehung der breiten und flachkonkaven Facetten in Verbindung stehen. Der plane und gleichmäßige Verlauf der Rillen spricht dafür, dass dort ein Werkstück poliert wurde, das deutlich länger als der Polierstein gewesen ist.

INTERPRETATION UND VERWENDUNGSZWECK

Zunächst ist festzuhalten, dass es sich bei dem Fundstück um ein Unikat handelt, das bislang keine Parallelen im archäologischen Fundstoff des norddeutschen Tieflandes aufweist. Aufgrund von Größe, Gewicht und Rohmaterial sowie der unterschiedlich breiten, teils matt glänzenden Facetten ist in der letzten

Arbeitsphase von einer Funktion als Polierstein auszugehen. Das relativ große Gewicht und der Längsverlauf der Bahnen sprechen für eine passive Nutzung als Unterlieger, auf dem das Werkstück aktiv vor und zurück bewegt wurde. Identische Bewegungen sind offensichtlich auch auf den vier schmaleren, aber deutlich tieferen V- und U- förmigen Rillen ausgeführt worden.

Geht man von einer passiven Nutzung des Poliersteins aus, entstanden die variablen Facetten sukzessive nach dem Picken des Ausgangsgerölls. Allein für das Picken ist je nach Größe und Form des Gerölls ein enormer Zeitaufwand notwendig, der bei einigen Hundert Stunden gelegen haben dürfte. Zur Anlage der Facetten musste der Stein fixiert und im weiteren Verlauf um die Längsachse gedreht werden. In einem letzten Arbeitsgang entstanden die schmalen V- und U- förmigen Rillen, die zusammen mit den übrigen Polierflächen eine multifunktionale Nutzung des Fundstücks charakterisieren. In dieser fortgeschrittenen Nutzungsphase wurde das Gerät dann aufgegeben, so dass es seine schwach gewölbte, tonnenförmige Oberfläche beibehielt. Von dauerhaft genutzten facettierten Schleifsteinen aus Skandinavien (s. u.) ist bekannt, dass sie im Endstadium durch die mittig am stärksten wirksame Materialabnahme eine knochenförmige Form mit knollenförmig verdickten Enden ausbilden.

Gustav Schwantes schloss sich bei der Funktionszuweisung des Steins in seinem Überblickswerk zur „Vorgeschichte Schleswig-Holsteins“ (Schwantes 1939) der Beurteilung der schwedischen Archäologen Otto Rydbeck und Sven Nilsson an. Beide vermuteten seinerzeit (Malmer 1962, 567 Anm. 4), dass die skandinavischen facettierten Schleifsteine zur Fertigung der Schneidenpartie von Flinthohlbeilklingen (Dechselklingen) dienten, ohne dies experimentell überprüft zu haben. Johanna Mestorf ist in der Erstpublikation des Stückes von 1886 deutlich vorsichtiger und spricht von einem „besonders schöner Schleifstein“ (Mestorf 1886) ohne nähere Funktionszuweisung. Schon Otto Rydbeck (1916) hatte erkannt, dass beim Polieren von Hohlschneiden auf facettierten Schleifsteinen am Schleifgut tiefe Grate entstehen, die nur aufwendig zu entfernen sind. Nach Untersuchungen von Erik Hinsch (1956) und praktischen Versuchen (Harm Paulsen, mündl. Mitt.) ist es sehr wahrscheinlich, dass bei den Flinthohlbeilklingen das konkave, vielfach symmetrische Schneidenende zunächst durch Schlag und/oder Druckretuschen vorpräpariert wurde (s. auch Malmer 1962) und für den Grobschliff z. B. die abgerundete Kante einer größeren Schleifmulde diente. Zur abschließenden Feinpolitur eignet sich am besten ein Handschleifstein, der mittels leichter Drehung in der Hohlschneide so geführt wurde, dass dabei weder die bruchempfindliche Schneide zersplitterte, noch dass es zu einer Riefenbildung kam. Arbeitstechnisch ist auf einer tonnenförmig gewölbten Oberfläche eines passiv genutzten Schleifsteins die Herstellung einer (symmetrischen) Hohlschneide nicht möglich. Außerdem steht die Anzahl der Fertigprodukte und Halbfabrikate von hohlgeschliffenen Flintdechselklingen in Norddeutschland im krassen Gegensatz zum Unikat, sollte dieses Arbeitsgerät zur Herstellung einer Hohlschneide geeignet gewesen sein. Vieles spricht dafür, dass facettierte Poliersteine nicht zur Oberflächenbearbeitung von jungsteinzeitlichen Flintgroßgeräten geeignet waren. Damit kommen als mineralische Werkstücke nur solche aus Felsgestein in Betracht. Allgemein gibt es im archäologischen Fundmaterial nur wenige konkrete Hinweise darauf, wie oder womit jungsteinzeitliche Werkzeuge und Waffen aus Felsgestein geschliffen bzw. poliert wurden.

Aktualistische Versuche mit trichterbecherzeitlichen (TBK) Streitäxten, wie z. B. der Herstellung einer Replik der Sarup-Axt aus Kalmarsund-Sandstein oder einer durchlochten Scheibenkeule aus metamorphen Gesteinen (Porphyr, Basalt oder Diabas) lassen vermuten, dass diese Waffentypen aus einem passenden Geröll herausgepickt wurden, bis die gewünschte Form annähernd erreicht war. Als Arbeitsgeräte eignen sich Spitzschläger aus Flint oder faustgroße Klopfsteine aus Flint oder quarzitischem Sandstein (Abb. 4), wie sie aus jungsteinzeitlichen Siedlungen vorliegen, wo sie auch zum Aufrauen von Mahlmulden verwendet wurden (Arnold 1988; Weiner 2012a; Hein und Lund 2017). Für die abschließende Feinpolitur insbesondere der Schneidenpartien sind Handschleifsteine z. B. aus feinkörnigen Sandsteinen oder aus Lydit geeignet, die vermutlich auch zum Polieren der empfindlichen Schneiden von Flintbeilklingen eingesetzt wurden (ebd.). Die Oberflächenbehandlung von Keulen, Streitäxten und Hämmern aus Felsgestein wie auch das Profilieren von scharfkantigen Facetten, feinen Rillen oder Bohrlochverstärkungen könnte ebenfalls mit Hilfe von Handschleifsteinen (z. B. aus feinkörnigen, schiefrigen Gesteinen) ausgeführt worden sein. Tatsächlich steht den *ca.* 1500 mittel- und jungneolithischen Streitäxten und Keulen aus Schleswig-Holstein nur dieses singuläre facettierte Arbeitsgerät gegenüber. Damit ist eigentlich ausgeschlossen, dass es in Norddeutschland zur Politur von Streitäxten diente. Gegen eine Verwendung als Polierstein für Felsgesteinsgeräte spricht auch der Verlauf der vier Rillen mit V- oder U-förmigem Profil. Bei der Nutzung dieser glatten, mehr oder minder linearen Vertiefungen ist das Werkstück offensichtlich länger als der Polierstein gewesen. Auch zum Schärfen von Metallspitzen, z. B. einer breiten Nadel oder einer Speer- bzw. Lanzenspitze, sind diese Rillen ungeeignet, da bei diesem Schärfungsvorgang in der Regel in den Vertiefungen und Poren metallischer Abrieb abgelagert wird. Bei mikroskopischen Untersuchen konnten allerdings keine Reste von Metall nachgewiesen werden.

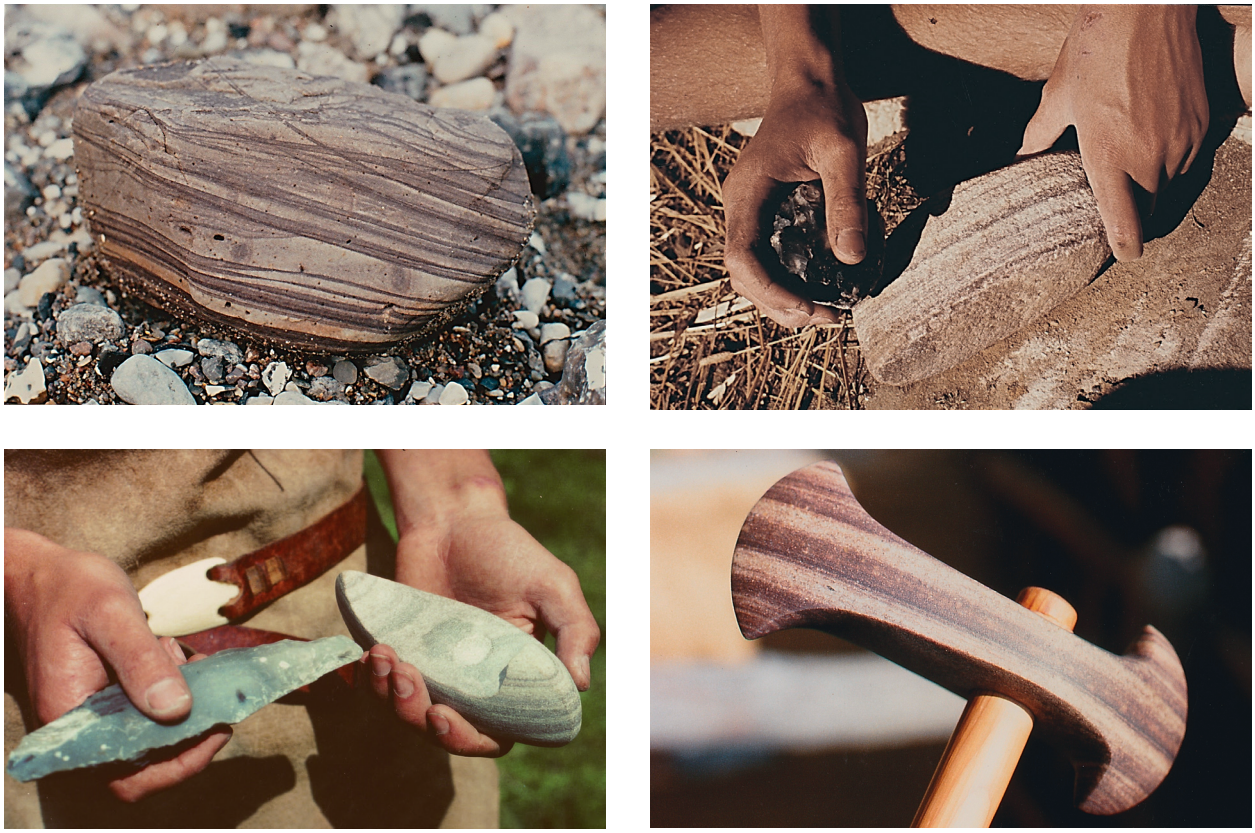

*Abb. 4. Herstellung einer TBK-Felsgesteinsaxt aus gebändertem Kalmarsund-Sandstein durch Tobias Paulsen im Steinzeitdorf Hjerl Hede 1980–84. **1** Rohmaterial (Felsgesteinsgeröll); **2** Picken der Oberfläche mit Klopfstein aus Flint; **3** Picken des Schaftloches mit Flintdolchgriff; **4** fertig geschliffene Streitaxt (Fotos: Harm Paulsen).*

FACETTIERTE SCHLEIFSTEINE IN SKANDINAVIEN

Auf der Suche nach Vergleichsfunden stößt man ausschließlich in Skandinavien und dort in Teilen Schwedens, Südnorwegens und auf Bornholm auf die multifacettierten Schleifsteine (sog. *„lårbensformade slipstenar“*, Abb. 5). Über 1000 Exemplare dieses Typs aus Sandstein oder Quarzit wurden dort entdeckt und werden als passive Schleifsteine für zur Herstellung von jungneolithischen Bootsäxten interpretiert, einer Sonderform der nordischen Streitäxte (Malmer 1975; 2002; Nielsen 2001; Jensen 2001; Stilborg und Wehlin 2022). Sie datieren in ein enges Zeitfenster, nämlich der schnurkeramischen Kultur bzw. nordische Bootaxtkultur zwischen 2800–2300 cal BC. Ein enger Zusammenhang von facettierten Schleifsteinen und Boots-/Streitäxten konnte in Schweden auch durch Grabfunde und Deponierungen in Niederungen belegt werden (Malmer 1962; Österholm 2002; Petersson 2018).

Nach Mats Malmer (1962, 162–63, 281 Abb. 87) lassen sich zwei Haupttypen klassifizieren. Der einfach facettierte Typ A mit max. vier Schlifffacetten, grob quadratischem Querschnitt und Längenmaßen von 10 bis 38 cm scheint die ältere Form zu sein und ist in Zentralschweden auch in Gräbern gefunden worden. In Turinge westlich von Stockholm wurden in einem Totenhaus der späten Bootaxtkultur (*ca.* 2300 cal BC) zehn Gruben mit gebrannten Menschenknochen von mind. acht Individuen verschiedenen Alters und Geschlecht ausgegraben. Dazu kommen deponierte Keramikgefäße, kleine Beile, eine Streitaxt und Tierknochen. Ein facettierter Schleifstein vom Typ A aus Sandstein lag zwar in sekundärer Position, dürfte aber Teil der Grabausstattung gewesen sein (Lindström und Boije 2000). Auf der Insel Gotland wurden auf dem grübchenkeramischen Gräberfeld von Ajvide über 80 Skelette ausgegraben. In zwei Bestattungen waren Typ A-Schleifsteine neben der rechten Schulter des Verstorbenen deponiert worden, wobei die linke Hand auf dem Schleifstein gelegen haben soll (Burenhult 2002; Amlé 2013; Palmgren und Martinsson-Wallin 2015).

Die Schleifsteinvariante B oder der multifacettierte Typus besitzt regelhaft fünf oder mehr scharf konturierte, konkave Schlifffacetten. Die Längenmaße schwanken zwischen 15–40 cm, die Mehrzahl der Typ B-Schleifsteine wurde aus Sandstein und nicht aus Quarzit

Abb. 5. Auswahl von multifacettierten Schleifsteinen aus Südschweden. 1 Südschonen (ohne Fundort); 2 Vellinge, Schonen; 3 Bohuslän, ohne Fundort; 4 Schonen, ohne Fundort (Fotos: 1 Ekenberg, 2186646 autionet.com; 2 Sydsvensk Arkeologi AB, Regionsmuseet Skåne Kristianstad 2014; 3 Digitalt Museum: Smålands Museum, Vaxjö; 4 Digitalt Museum: Göteborg Stadsmuseum).

hergestellt. Sie weisen je nach Abnutzungsgrad schwach bis stark konkave Schleifbahnen und knollenförmig verdickte Enden auf. Schleifsteine vom Typ B treten nur selten in Gräbern auf, sowohl bei Typ A als auch Typ B dominieren die unstratifizierten Einzelfunde.

Eine typo-technologische Ähnlichkeit zum schleswig-holsteinischen Unikat ist wenig prägnant und dessen eigentümliche Form- und Oberflächenbeschaffenheit nur dann zu erklären, wenn es sich beim hiesigen Exemplar um ein frühes Nutzungsstadium handelt. Produkte aus einer Frühphase sollten sich ebenso wie gepickte Gerölle in skandinavischen Fundinventaren finden lassen, sind aber dort offensichtlich sehr selten oder kaum beachtet worden.

Wie ist nun die Entdeckung des Poliersteins in Schleswig-Holstein zu erklären? Sollte es sich tatsächlich um ein skandinavisches Produkt handeln, kommt als eine Erklärung ein Transfer des Stückes aus Schweden (evtl. Schonen) während des Jungneolithikums in Betracht. Wie das kleine Kontingent von typischen Bootsäxten (Schultrich 2018, 121 Abb. 34; s. u.) könnte auch der facettierte Polierstein im Zuge von Handelskontakten nach Norddeutschland importiert worden sein. Dagegen spricht jedoch die Verbreitung von skandinavischen Schleifsteinen vom Typ B, denn außer Einzelstücken auf Bornholm und von Inseldänemark (Ebbesen 2011) ist die kimbrische Halbinsel fundleer. Es ist nur sehr schwer vorstellbar, dass aus dem Hauptverbreitungsgebiet der facettierten Schleifsteine im Süden Schwedens ausgerechnet ein tonnenförmiges Einzelstück aus Quarzit als Handelsgut nach Schleswig-Holstein gelangt sein soll und nicht eines der zahlreichen knochenförmigen Exemplare aus Sandstein. Die gleiche Schlussfolgerung gilt im Übrigen auch, wenn es sich um ein modernes „touristisches“ Mitbringsel handeln würde, das Mitte des 19. Jts. von einer Privatperson in Schweden gefunden oder erworben wurde und später als fundortloses Artefakt in den Museumsbestand der Kieler Sammlung gelangte.

Eine weitere Möglichkeit ist, dass es sich um eine lokale Kopie oder besser um den Versuch einer solchen handelt. Das Rohmaterial ist im Jungmoränengebiet Norddeutschlands zahlreich als Geschiebe anzutreffen. Sollte Schleswig-Holstein tatsächlich das Herstellungsgebiet gewesen sein wäre eine Theorie, dass das Gerät von einer Person produziert wurde, der das skandinavische Design zwar bekannt war, die aber keine exakte Vorstellung vom Endprodukt hatte (mündl. Mitt.

von Cecilia Lidström, Uppsala). Wenn das Unikat tatsächlich zum Schleifen von Streitäxten gedacht war, hatte der Hersteller möglicherweise das „falsche" Rohmaterial ausgewählt und musste die Arbeiten aufgrund der großen Härte von Quarzit in einem Frühstadium aufgeben.

Am Ende bleiben wichtige Fragen offen, die die Provenienz, die Art der Verwendung und das Material des zu bearbeitenden Werkstückes betreffen. Bislang sind die multifacettierten Schleifsteine aus Skandinavien (Malmer Typ B) typologisch nur sehr vage mit dem schleswig-holsteinischen Fundstück vergleichbar und der versierte Experimentalarchäologe Harm Paulsen vermutet sogar, dass aus dem hiesigen facettierten Polierstein niemals ein *knochenförmiges* Exemplar werden konnte. Damit wäre auch in Frage gestellt, ob er tatsächlich zur Bearbeitung von jungneolithischen Felsgesteinsgeräten wie Streitäxten oder Keulen diente und nicht eine völlig andere Funktion hatte, die möglicherweise außerhalb der handwerklichen Tätigkeiten zu suchen ist.

POTENZIELLER IDEENTRANSFER

Obwohl weder zeitlich noch funktional ein abschließendes Urteil zu dem Polierstein zu fällen ist, bevorzugen wir die Idee, dass das Gerät im Jungneolithikum im lokalen Kontext nach schwedischem Vorbild reproduziert wurde. Dabei stieß die herstellende Person auf das Problem, dass der extrem harte Stein trotz Nutzung nicht die konkave Form der schwedischen Vorbilder annahm. Dennoch konnte es zeitweise ähnlich verwendet worden sein, nämlich zum Polieren der Nacken oder der balligen Enden von Streitäxten (Abb. 6).

Folgen wir dieser Idee, so reiht sich das Stück in eine Reihe von Funden ein, die einen sich intensivierenden Austausch im westlichen Ostseeraum anzeigen. Artefakte der frühen Einzelgrabkultur sind beinahe ausschließlich auf die Kimbrische Halbinsel und Norddeutschland beschränkt, und Funde der frühen Bootaxtkultur selten außerhalb Schweden und Norwegens anzutreffen (Iversen 2015, 51). Auf den dänischen Inseln setzt sich parallel das Mittelneolithikum V, die späte TBK, bis etwa 2600 cal BC fort (Iversen 2015, 2–24). In der Folgezeit verändert sich das Bild. Funde der mittleren und besonders der späten Einzelgrab- und Bootaxtkulturen sind häufig auf den dänischen Inseln verbreitet. In diesem Zeitraum mehren sich zudem Funde der Einzelgrabkultur in Schweden und Norwegen, allen voran Streitäxte (Hinsch 1956, 39; Malmer 1962, 748–752). Artefakte der Bootaxtkultur sind nun auch in Jütland, Schleswig-Holstein und Mecklenburg-Vorpommern vorhanden (Malmer 1962, 753–754; Jacobs 1991, 24; Hübner 2005, 137; Schultrich 2018, 121).

In Schleswig-Holstein gibt es acht Streitäxte, die in ihrer Form eindeutig ins Milieu der Bootaxtkulturzu zählen sind (Schultrich 2018, 121). Diese wurden nicht nur nahe der Ostseeküste gefunden, sondern auch weit im Landesinneren, im heutigen Dithmarschen (Abb. 6.1–2). Eine Streitaxt stammt aus dem Halbkreiswall der mittelalterlichen Siedlung Haithabu, was auf eine interessante Artefaktbiografie hinweist (Schultrich 2018, 389, Kat. 1193; Kurasiński 2021, 15). Drei von acht Streitäxten wurden hinsichtlich ihres Gesteines analysiert (Schultrich 2018, 121). Sie bestehen aus Diabas (einmal konkret Åsby–Diabas), was sowohl in Schweden als auch im Geschiebe Schleswig-Holsteins vorkommt und somit nicht zur Beurteilung des Austauschs taugt. Allerdings ist die Seltenheit dieser sehr speziellen Form, bootsaxtförmig und mit plastischen Schafttüllen versehen, in Schleswig-Holstein und Jütland gegenüber der Häufigkeit in Schweden als Argument für einen direkten Austausch zu werten.

Neben den Streitäxten zeugen die sog. D-Pfeiltypen von einer zunehmenden Kommunikation im Ostseeraum. Dies sind die späten Vertreter von Flintprojektilen, die ins Milieu der Grübchenkeramik gehören. Während die frühen Pfeiltypen (A, B und C) des Mittel- und beginnenden Jungneolithikums vor allem an das Verbreitungsgebiet der Grübchenkeramik gebunden sind, erweitern die Projektile vom D-Typ des entwickelten Jungneolithikums ihren Verbreitungsraum (Petersen 1993, 79–80; Hübner 2005, 436–37). In Mecklenburg– Vorpommern besitzen diese Pfeilformen tatsächlich eine küstenorientierte Verbreitung (Jacobs 1991, 26) und in Schleswig-Holstein durch ihr konzentriertes Vorkommen in Ostholstein (Abb. 7) tendenziell auch, was in Anbetracht der geringen Anzahl an Funden mit Ortsangabe jedoch mit Vorsicht zu bewerten ist (Schultrich 2018, 148).

Im weiteren Verlauf zeugt die selbstständige Flintdolchproduktion in Nordjütland, Schleswig- Holstein, auf den Dänischen Inseln und Mecklenburg-Vorpommern von einer intensiven Kommunikation und der Etablierung eines geteilten Wertesystems im Spätneolithikum (*ca.* 23/2250–1700 cal BC, Kühn 1979; Rassmann 1993). So, wie wir es für den Polierstein annehmen, wurde eine gemeinsame Idee lokal autark umgesetzt. Womöglich zeugt auch das hiesige Fundstück von den aufgelockerten Kontakten im Ostseeraum und den Beginn autarker Reproduktion von geteilten Ideen.

Abb. 6. Auswahl von Streitäxten aus Schleswig-Holstein. ***1–2*** *Bootsäxte ohne Fundort, Dithmarschen (Schultrich 2018, 443–444);* ***3–6*** *Grabfunde:* ***3*** *F1-Axt Horst, Steinburg. Dithmarschen;* ***4*** *E2-Axt Pahlkrug, Dithmarschen;* ***5*** *F3-Axt Hopen, Dithmarschen;* ***6*** *A2-Axt Pahlkrug (Fotos:* ***1–2*** *Sebastian Schultrich;* ***3–6*** *Claudia Janke).*

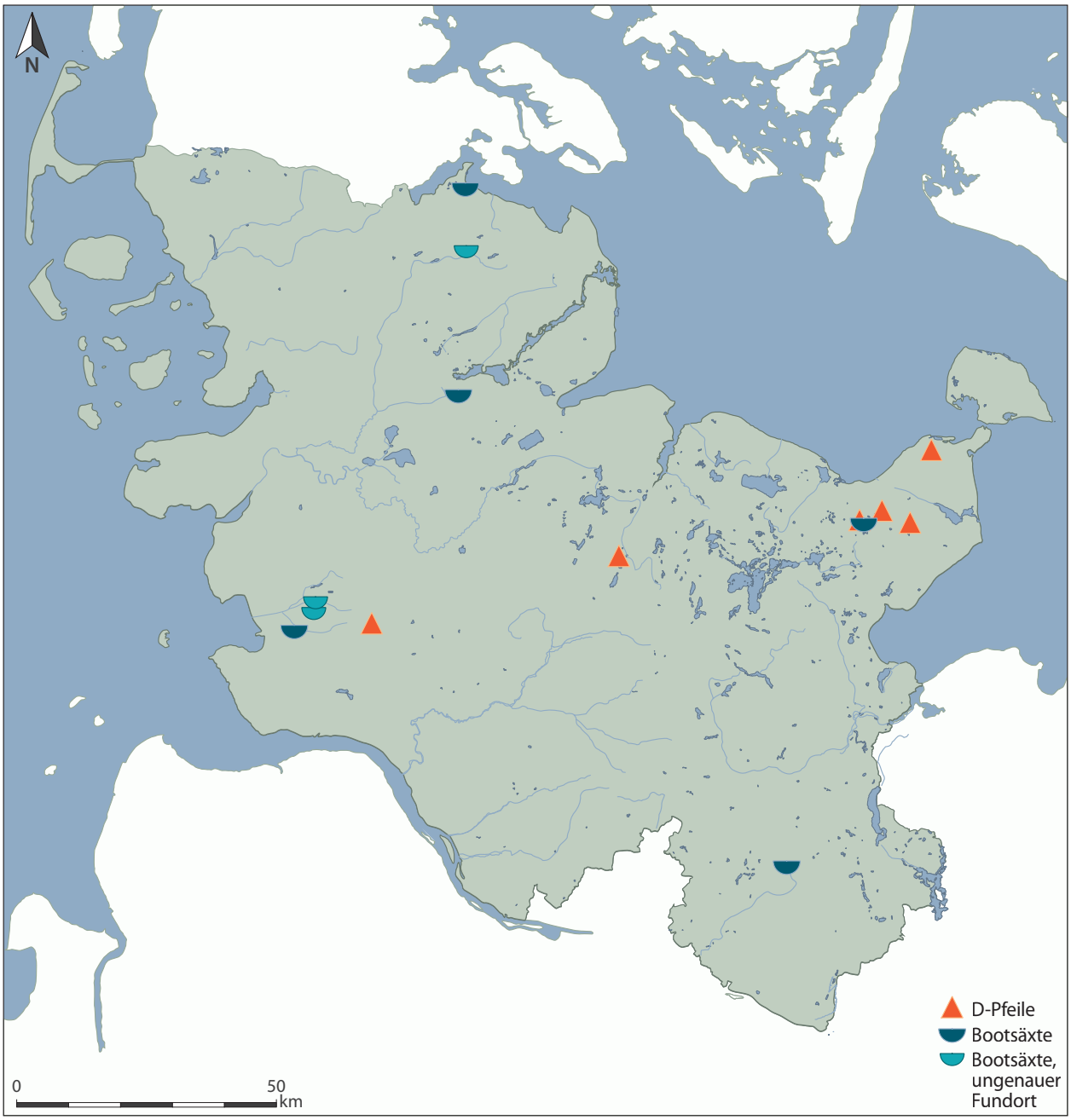

Abb. 7. Verbreitung von Bootsäxten und D-Pfeiltypen in Schleswig-Holstein (Grafik: Sebastian Schultrich, Karin Winter).

LITERATUR

Amlé, A., 2013. *Kärlens gåta. En studie av gropkeramiska gravkärl på Gotland.* Kandidatuppsats. Institutionen för kultur, energi och miljö. Gotland: Avdelningen för arkeologi.

Arnold, V., 1988. Zu einigen gut erkennbaren, aber wenig beachteten Gebrauchsspuren an neolithischen Flintgeräten Schleswig-Holsteins. *Archäologische Information* 11(2), 60–66.

Bräunlich, M., 2021. *Quarzit.* http://www.kristallin.de

Brozio, J.P., 2016. *Megalithanlagen und Siedlungsmuster im trichterbecherzeitlichen Ostholstein*, Frühe Monumentalität und soziale Differenzierung 9. Bonn: Habelt.

Burenhult, G., 2002. The Grave-field at Ajvide. *In:* G. Burenhult, Hrsg. *Remote sensing: Applied techniques for the study of cultural resources and the localization, identification and documentation of sub-surface prehistoric remains in Swedish archaeology.* Hässleholm: Tjörnarp, 31–42.

Clausen, I., 1989. Geröllstrände – Rohstoffbasen steinzeitlicher Flinthandwerker. *Archäologische Nachrichten aus Schleswig-Holstein Aktuell*, 14–20.

Ebbesen, K., 2011. *Danmarks Megalitgrave*. København: Attika.

Floss, H., 2012a. Lithische Rohmaterialien im Rheinland. *In: Floss 2012b*, 55–62.

Floss, H., Hrsg., 2012b. *Steinartefakte. Vom Altpaläolithikum bis in die Neuzeit*. Tübingen: Kerns Verlag

Hansen, P.V. und Madsen, B., 1983. Flint Axe Manufacture in the Neolithic. An Experimental Investigation of a Flint Axe Manufacture Site at Hastrup Vænget, East Zealand. *Journal of Danish Archaeology* 2, 43–59.

Harding, P., 1987. An experiment to produce a ground flint axe. *In:* G. de G. Sieveking und M.H. Newcomer, Hrsg. *The human uses of flint and chert*. Cambridge: Cambridge University Press, 37–42.

Haßmann, H., 2000. *Die Steinartefakte der befestigten neolithischen Siedlung von Büdelsdorf, Kreis Rendsburg–Eckernförde*, Universitätsforschungen zur prähistorischen Archäologie 62. Bonn: Habelt.

Hein, W. und Lund, M., 2017. *Flinthandwerk*. Ludwigshafen: Verlag Angelika Hörnig.

Hinsch, E., 1956. *Yngre Steinalders Stridsøkskulturer i Norge*. Bergen: John Griegs.

Hoika, J., 1987. *Das Mittelneolithikum zur Zeit der Trichterbecherkultur in Nordostholstein: Untersuchungen zur Archäologie und Landschaftsgeschichte*, Offa-Bücher 61. Neumünster: Wachholtz Verlag.

Højlund, F., 1973/74. Stridsøksekulturens flintøkser og –mejsler. *Kuml*, 179–196.

Hübner, E., 2005. *Jungneolithische Gräber auf der Jütischen Halbinsel: Typologische und chronologische Studien zur Einzelgrabkultur*, Nordiske Fortidsminder Serie B 24. København: Det kongelige nordiske Oldskriftselskab.

Iversen, R., 2015. *The Transformation of Neolithic Societies. An Eastern Danish Perspective on the 3rd Millennium BC*, Jutland Archaeological Society Publications 88. Aarhus: Aarhus University Press.

Jacobs, J., 1991. *Die Einzelgrabkultur in Mecklenburg-Vorpommern,* Beiträge zur Ur- und Frühgeschichte in Mecklenburg-Vorpommerns *24*. Schwerin: Archäologisches Landesmuseum Mecklenburg-Vorpommern.

Jensen, J., 2001. *Danmarks Oldtid*. København: Gyldendal.

Karsten, P., 1994. *Att kasta yxan i sjön: en studie över rituell tradition och förändring utifrån skånska neolitiska offerfynd*. Lund: Almqvist & Wiksell.

Kegler-Graiewski, N., 2012. Mahl- und Schleifsteine. *In: Floss 2012b*, 779–790.

Kühn, H.J., 1979. *Das Spätneolithikum in Schleswig-Holstein*, Offa-Bücher 40. Neumünster: Wachholtz Verlag.

Kurasiński, T., 2021. Kamienie zrodzone z pioruna. O nietypowej formie recyklingu w średniowieczu i czasach nowożytnych. *Przegląd Archeologiczny* 69, 5– 62.

Lindström, J. und Boije, M., 2000. Ett dödshus från stridsyxetid. *In:* P. Bratt, J. Lindström und Å. Lundström, Hrsg. *Ett dödshus från stridsyxetid arkeologisk delundersökning av RAA 415, ett neolitiskt dödshus med offerplats och en äldre järnåldersboplats samt RAA 319:2, en stensträng, Söderby 2:3, Turinge socken*. Nykvarns kommun, Södermanland. Stockholm: Stockholms Läns Museum.

Lindström, T. und Patriksdotter, A., 2020. Förbisedda föremål: gropkeramiska „facettstenar" (Overlooked object: Pitted Ware „faceted stone tools"). *Fornvännen* 115(2), 73–80.

Madsen, B., 1984. Flint Axe Manufacture in the Neolithic: Experiments with Grinding and Polishing of Thin-Butted Flint Axes. *Journal of Danish Archaeology* 3, 47–62.

Malmer, M.P., 1962. Jungneolithische Studien. *Acta Archaeologica Lundensia* 8(2). Bonn: Habelt.

Malmer, M.P., 1975. *Stridsyxekulturen i Sverige och Norge*. Lund: LiberLäromedel.

Malmer, M.P., 2002. *The Neolithic of South Sweden. TRB, GRK, and STR*, The Royal Swedish Academy of Letters History and Antiquities. Stockholm: Almqvist & Wiksell.

Mestorf, J., 1886. Vorgeschichtliche Alterthümer aus Schleswig-Holstein. Steinzeit. *Schriften des Museums für vaterländische Alterthümer*. Hamburg: Otto Meißner.

Nielsen, P.O., 2001. *Danmarkshistorien. Stenalderen (Bondestenalderen)*. København: Sesam.

Österholm, I., 2002. The Jakobs/Ajvide site at Eksta. *In:* G. Burenhult, Hrsg. *Remote sensing, Vol. II: Applied techniques for the study of cultural resources and the localization, identification and documentation of sub-surface prehistoric remains in Swedish archaeology*. Hässleholm: Tjörnarp, 17–30.

Palmgren, E. und Martinsson-Wallin, H., 2015. Analysis of late mid–Neolithic pottery illuminates the presence of a Corded Ware Culture on the Baltic Island of Gotland. *Documenta Praehistorica* XLII, 297–310.

Petersen, P.V., 1993. *Flint fra Danmarks Oldtid*. København: Høst og Søn.

Petersson, A., 2018. *Stridsyxekulturens uppkomst i Sverige. Teorier vs Naturvetenskap*. Göteborgs Universitet.

Rassmann, K., 1993. *Spätneolithikum und frühe Bronzezeit im Flachland zwischen Elbe und Oder*, Beiträge zur Ur- und Frühgeschichte Mecklenburg-Vorpommerns 28. Lübstorf: Landesarchäologie MV.

Rudolph, F., 2017. *Das große Buch der Strandsteine*. Neumünster: Wachholtz Verlag.

Rydbeck, O., 1916. Några iakttagelser beträffande vissa yxtyper från stenåldern. *Fornvännen* 11, 119–146.

Schultrich, S., 2018. *Das Jungneolithikum in Schleswig-Holstein*, Scales of Transformation in Prehistoric and Archaic Societies 1. Leiden: Sidestone.

Schwantes, G., 1939. *Die Vorgeschichte Schleswig-Holsteins*. Neumünster: Wachholtz Verlag.

Stilborg, O. und Wehlin, J., 2022. 2000 år utan keramik? Mot en förståelse av keramiktraditionens försvinnande i Dalarna under mellanneolitikum. *Fornvännen* 22(1), 1–15.

Struve, K.W., 1955. *Die Einzelgrabkultur in Schleswig- Holstein und ihre kontinentalen Beziehungen*, Offa-Bücher 11. Neumünster: Wachholtz Verlag.

Weiner, J., 2012a. Schlaggeräte aus Stein. *In: Floss 2012b*, 141–146.

Weiner, J., 2012b. Neolithische Beilklingen aus Feuerstein. *In: Floss 2012b*, 827–835.

Large Standing Stones – A Remarkable Career

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KEYWORDS: *menhir, standing stone, Neolithic sanctuaries, depositions*

Abstract

This article deals with the phenomenon of standing stones, which has long received little attention in prehistoric archaeology. In the light of recent ^{14}C data, it has been shown that menhirs were erected in Western and Central Europe as early as the beginning of the 5th millennium BCE. The few excavations show that gifts in the form of stones, stone axes, flint blades, grinding stones and ceramic vessels were deposited at the stones. These can be interpreted as gifts through which one could come into contact with the power represented by the stone. This is therefore a special form of Neolithic sanctuary that needs to be researched in more detail.

Zusammenfassung

In diesem Beitrag wird das Phänomen der großen Steine behandelt, das von der prähistorischen Archäologie lange wenig beachtet wurde. Im Lichte neuerer ^{14}C-Daten zeigt sich, dass die Menhire bereits zu Beginn des 5. Jahrtausends v. Chr. in West- und Mitteleuropa aufgestellt wurden. Die wenigen Ausgrabungen zeigen, dass an den Steinen Gaben in Form von Steinen, Steinbeilen, Flintklingen, Mahlsteinen und Keramikgefäßen abgelegt wurden. Diese lassen sich als Gaben interpretieren, durch die man mit der Macht, die durch den Stein repräsentiert wurde, in Kontakt treten konnte. Es handelt sich also um eine besondere Form neolithischer Heiligtümer, die es genauer zu erforschen gilt.

INTRODUCTION

The large standing stones of prehistory continue to be a source of fascination. May they be single stones or rows of thousands of stones, as at the famous site of Carnac in Brittany: it is hard to escape their captivating presence. The immovability of the upright standing stones and their permanence pull us in and at the same time keep us at a distance, Stone seems to be everything that man is not: hard, solid, immobile, eternal. Large standing stones can only be moved by numerous helpers. In our perception, stones have no measurable age. The French painter Pierre Soulages once remarked that although we know that they are prehistoric, their presence and force make us forget their origin (Soulages 2002). Their presence, as they appear before us, is enigmatic and fascinating. Gerardus van der Leeuw argued in a similar manner: "*The notion of power has always been attached to stones of a particular shape or size.*" (Leeuw 1956, 39)

This notion of power is fueled by the mentioned characteristics of stone, its stability and eternity. The idea of erecting large stones has therefore certainly not only come into the world once. Nevertheless, large stones are not an anthropological universal in the strict sense, but historical phenomena that must be described precisely in time and space.

They are popularly known as the "long stone" (*der Langestein*) or "*pierre longue*". When science began to study them in the 18th century, Anne-Claude-Philippe Comte de Caylus, one of the leading antiquarians of his time, called them pyramids of grotesque form (Caylus 1764, 361). Anne-Claude-Philippe Comte de Caylus was fully aware that the shape of these stones is not natural, but that they are man-made.

The term menhir was only introduced later, at the turn of the 18th and 19th centuries, by historian Pierre Jean-Baptiste Legrand d'Aussy. At the end of the 18th century, he argued against allegedly inaccurate and inappropriate terms such as erected, or upright stones in order to introduce a word from Lower Breton, where the "rough" obelisks (*obélisques bruts*) are called ar-men-ir (Legrand d'Aussy 1799, 545). Men-ir means long stone, ar, the definite article is omitted. This was of course no more accurate than speaking of a "long stone". The decisive factor for Legrand d'Aussy was that the term belonged to France.

The discussion about these terms was controversial from the very beginning. In 1893, Salomon Reinach wrote that dolmens, like menhirs, were dubious terms whose neo-Celtic form should not be used as an argument in the controversy over the ethnicity of the builders of the dolmens (Reinach 1893, 37). This was written at a time when the ethnic paradigm, the "*völkische Deutung*" of prehistoric monuments had already become dominant. Nevertheless, the terms have expanded inexorably and found their way into the international scientific literature, so that even in the Kazakh steppe they are now referred to as menhirs or in the northern Black Sea region as *cromlechs*. In French scientific literature, on the other hand, the term menhir has largely given place to the more prosaic term "*pierre dressée*".

In France, the large standing stones were widely and controversially discussed as an archaeological phenomenon since the 18th century. In Germany, on the other hand, there was a certain confusion as to the meaning of the strange monoliths, which were known in south-west Germany as *Hinkelsteine*, *Spindelsteine*, *Gollensteine* or *Langesteine* (Kofler 1888, 127). The term "Hinkelstein" is commonly used by the people of south-west Germany and tells the story of the remarkable misunderstanding of the word Hünenstein (stone of giants). Misunderstood as "*Hühnerstein*" (stone of chicken), the term was then translated into the dialectal "*Hinkelstein*" in the Palatinate and in Rhinehesse and southern Hesse. In these regions, the *Hinkel* is a small chicken (Grimm and Grimm 1877, 1952). There are also folk tales that a chicken and its chicks are said to live under the monoliths. The new (misunderstood) name thus gave rise to new, invented traditions of interpretation. Today, the large stones are probably best known to a wide audience thanks to the global success of Asterix and Obelix. While Obelix produces *Hinkelsteine* in the German edition, he continues to produce menhirs in the French original.

For the *pre-literate* cultures, we cannot find out what concrete meaning those who erected the large stones attached to their actions, but some approximations are possible. Serge Cassen *et al.* (2011, 238) believe that the erected stones point to the past and the future, that they force an attitude on the part of the viewer and that the stones form a boundary between two spaces, two worlds. The medium was probably so successful because it allowed only a few possible interpretations. It is a central aspect of the large standing stones that they were erected for permanence, and thus for commemoration.

Erecting large stones was a task that required a collective work effort. The first step was to break the stone and shape it into the desired form. Perhaps the greatest challenge was the transport, which took place over land, but also over water (Cassen *et al.* 2019). The prestige value of the stone was probably not only determined by its size, but also by the "foreign" origin of the stone, which had to be transported over a long distance. All of this was most likely associated with one or more festivities that accompanied the erection. This meant that the stone, once erected, was also associated with the commemoration of the erection. As these were necessarily communal endeavours, the erected stones could be interpreted as symbols of cooperation. The labor time invested in quarrying, working, and transporting the stone was probably relatively modest for a single menhir. More important was the social event, which probably required at least as much, if not considerably more time and labor. The erection of truly monumental stones certainly also had competitive aspects. Transporting a 20 m high stone weighing around 280 tones, such as the Grand Menhir (Fig. 1), was a different kind of work than erecting small stones weighing only two tones. Christian Jeunesse provides a convincing socio-historical classification:

"*Generally speaking, one could say that the existence of a king explains the invention of the lost wax technique in Varna or in the Maikop culture and drives the processes that led to the erection of the Er Grah broken menhir at Locmariaquer, and certainly not the reverse.*" (Jeunesse 2017, 184)

Fig. 1. Grand Menhir at Locmariaquer (Photo: Svend Hansen).

LARGE STONES: A NEOLITHIC PHENOMENON

Until a few decades ago, the dating of the large standing stones was still largely unknown and it was also assumed that they were Bronze Age and Iron Age menhirs. Today it is clear that the large standing stones in West Asia and Europe are predominantly a Neolithic phenomenon. In West Asia, the erection of large stones and large stone sculptures began as early as the Epipalaeolithic and pre-pottery Neolithic and continued there until at least the 4th millennium BCE. The oldest erected stone from Rosh Zin (Fig. 2) currently known in the south of the Levant is dated to the Natufian period (Avner 2001, 10 fig. 1; Avner and Kolska Horwitz 2017, 58 fig. 3). Unlike the later, large stones, it was carved. Several flint cores and an arrow shaft smoother were deposited at its base. In the Levant, the stelae are referred to as "*masseboth*", the Hebrew term for upright stones, in accordance with biblical tradition.

In the 10th millennium BCE, large anthropomorphic pillars were erected at Göbekli Tepe in Southeast Anatolia, which were grouped as circular buildings. The pillars were buried under a "backfill" of unworked stones, worked flint tools, thousands of grinding stones, runners, mortars and pestles, as well as anthropomorphic sculptures and human and animal bone remains. The excavators have recently emphasised the importance of a better understanding of the backfilled material for interpreting the buildings. The backfilling was a structured process in which artefacts

Fig. 2. Rosh Zin, Negev (after Avner 2001, 10 fig. 1).

and sculptures were deposited, often close to the pillars (Dietrich *et al.* 2019, 152).

A plausible idea seems to be that all these objects were not "backfill", *i.e.* merely filling material. Instead, in light of similar practices, one should consider that they were gifts that were deposited at the pillars. This applies not only to the sculptures and grinding stones, but also to the rubble and unworked stones. Ultimately, a convincing answer to this question will require further, methodologically different excavations in one or more pillar buildings.

By contrast, large stones were not part of the luggage of the Neolithic farmers who colonised Europe via various routes in the 7th and 6th millennia BCE. In Europe, however, a nucleus of the erection of large stones in *cromlechs* emerged as early as the 6th millennium BCE in the south-west of the Iberian Peninsula. Not much later, the erection of large stones can also be proven in Western France. The few available ^{14}C data show that large standing stones were erected in rows in the first quarter of the 5th millennium at the latest and thus mark the beginning of the Breton Neolithic (Cassen *et al.* 2015, 764). The radiocarbon date Ly-13083 (5930 ± 5) plays an important role because it proves the beginning of the erection of large stones in the first quarter of the 5th millennium BCE (5930 ± 45 BP, 4933–4714 cal BC). It comes from the foundation pit of the prominent menhir covered with numerous crooks (Fig. 3), which was later integrated as the headstone into the passage grave Table des Marchands in Locmariaquer (Le Rouzic and Keller 1936, 15 fig. 3). Menhirs thus also took on the function of cap stones.

Fig. 3. Headstone in the Table des marchands in Locmariaquer (after Le Rouzic and Keller 1936, 15 fig. 3).

LARGE STONES EXCAVATED

Large stones were also erected in southern Germany in the early 5th millennium. At the "Long Stone" (Fig. 4) in Einselthum, Donnersberg district, additional smaller stones, a stone pavement and sherds from the Rössen culture as well as a stone axe were unearthed during excavations in 1960 (Bosinski 1961, 173 fig. 3). Gerhard Bosinski favoured the interpretation as a grave, but it was probably a small cult site, of which only the long stone, clearly a female shape, 2.0 m high and 1.2 m visible, remained standing.

The first archaeological investigation of a row of standing stones was carried out by Charles-Tanguy Le Roux in the *alignement* of Moulin de Cojou near Saint-Just, dép. Ille-et-Vilaine (Le Roux *et al.* 1989). It is the

Fig. 4. 1–3 The "Long Stone" of Einselthum, Donnersberg district with excavation findings (after Bosinski 1961).

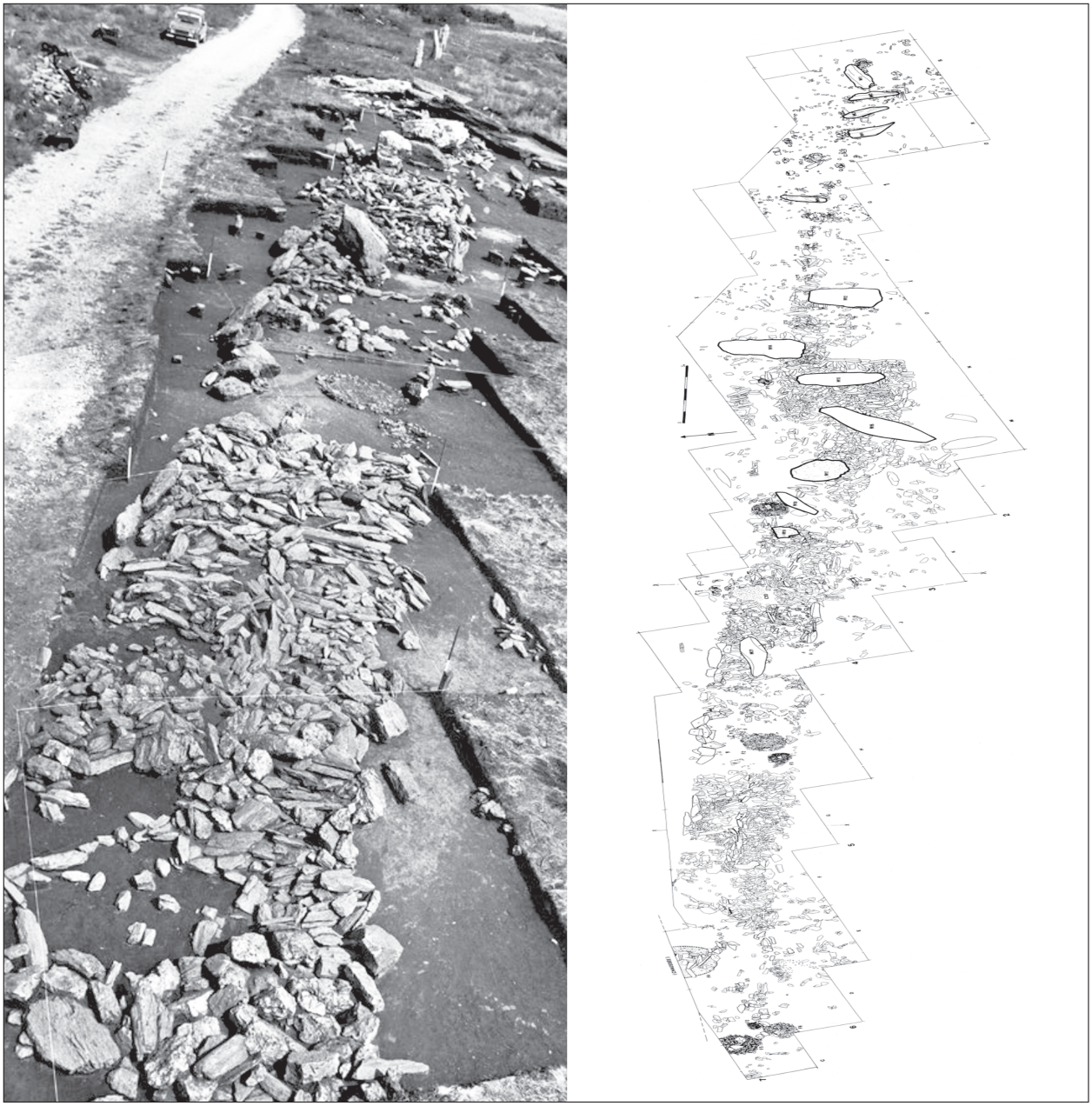

Fig. 5. The alignement of Moulin de Cojou near Saint-Just, dép. Ille-et-Vilaine (after Le Roux 1981, 397 fig. 2; Le Roux et al. *1989, 24 fig. 16).*

southern one of two neighbouring *alignements* (Fig. 5). The excavation uncovered its complex architecture. Ritual activities took place here for centuries, dating back to the beginning of the 5th millennium BCE and involving the deposition of small stones, pottery, stone arrowheads and stone axes. The stone row itself (Fig. 6) exhibits a typological range that was undoubtedly intentional, encompassing several different "types" of large stones and their meanings.

The Douet *alignement* on Hoëdic is one of the oldest megalithic monuments on the Atlantic coast (Large 2014). As very few blocks are arranged in a single row, they have never attracted the attention of researchers. It was erected in the Middle Neolithic 1, at the latest in the second quarter of the 5th millennium BCE. Jean-Marc Large's investigations have revealed block M1 to be a female-shaped stone. This is unusual but most likely explained by the fact that the *alignement* was not disturbed by modern interventions prior to the excavation. A large number of deposits were found next to and between the stones: Axe blades, flat pebbles, including a deposit of 14 long, narrow and thin pebbles, and pottery.

Fig. 6. View of the reconstructed row of stones from Moulin de Cojou (Photo: Svend Hansen).

Objects were also deposited at the base of the standing stones in the Groah Denn alignment, also located on Hoëdic: stone axes, pottery, natural stones, pebbles, but also grinding stones and a large flint blade (Large and Mens 2017, 54).

The excavations at the *Pierre de la grande corvée* of Monthelon, dép. Saône-et-Loire (Fig. 7) brought to light numerous stones, flint implements, arrowheads, a stone axe fragment, a small amount of Middle Neolithic pottery and a mill fragment deposited at the standing stone (Lagrost and Buvot 1996, 428 fig. 4).

In Lutry, Canton Vaud, numerous deposits of smaller stones were found at the *alignement* consisting of 23 standing stones (Masserey 1985). According to the pottery finds and the ^{14}C dates, the *alignement* was likely not erected before the 27th century BCE (Favre *et al.* 2016, 24–25). It would be the youngest *alignement* associated with ^{14}C dates, which seems to me very unlikely. There is also a much older ^{14}C date Arc-269 5440±60 BP (4443–4058 cal BC 2σ) which gives an idea from the time of erection. The *alignement* was uncovered *in situ* and thus reveals the arrangement of the closely grouped stones. They are grouped in descending size around the largest stone. This shows that size played a role and expressed a hierarchy. It should be emphasised that most of the small stones were placed in the area

Fig. 7. Findings at the standing stone of Monthelon (after Lagrost/Buvot 1996, 428 fig. 4).

of the particularly large menhirs. They are considered as wedge stones. However, a menhir weighing several tons cannot be wedged using small stones. The majority of these stones can therefore be seen as deposits, which once again confirms the hierarchisation of the stones, as they are concentrated at the large stones.

The younger statue stelae from the 4th millennium BCE are much less commonly found in their original position than the menhirs, so there are very few comparable finds. The finding at the Collado de Sejos near Saja, Prov. Cantabria, is therefore particularly significant (Bueno Ramírez *et al.* 1985, 36 fig. 6). The two decorated stones 1 and 2 were part of a group of five upright stones. The excavations yielded a number of other small stones, especially in the area of stele 1, some of which can be understood as wedges but especially as deposits. The fragment of a hand mill is particularly noteworthy. With five stelae, Collado de Sejos was undoubtedly a special place at an altitude of 1500 metres, perhaps a place of pilgrimage.

SANCTUARIES

These and other comparable findings raise the inevitable question of whether the alignments or even supposedly individual stones were sanctuaries. In recent years, research has focused on sites that can be identified as places where ritual activities took place through the deposition of objects. The localisation of (Bronze Age) hoard sites has played a particularly important role here, as these are interpreted as offerings to the imaginary powers (Hansen 2008; Hansen 2012; Yates and Bradley 2010). These sites should therefore have a clear connection with the deposition. However, only a few examples of prolonged use of these sites have been found to date. The existence of Neolithic and Bronze Age sanctuaries in Europe is therefore controversial. The clearest evidence in this respect is the Keros sanctuary, which is dated between 2750 and 2550 BCE. Colin Renfrew and Michael Boyd have uncovered more than 550 fragments of marble figurines (Cycladic idols) and more than 2000 fragments of stone vessels. Renfrew called Keros a pan-Cycladic sanctuary, which was frequented by pilgrims from all the neighbouring islands, who deposited broken pieces of the figurines there as gifts (Renfrew *et al.* 2012).

The Pigloner Kopf (Dosso di Piccolongo) in the municipality of Pfatten in South Tyrol can also be interpreted as a sanctuary from the 3rd millennium BCE (Oberrauch 2019; Pedrotti *et al.* 2022). It is an isolated rock tower on the Mitterberg, which drops vertically 25–50 m on all sides and only has two narrow entrances. The oldest deposits of flint arrowheads on the hilltop date from around 2900 BCE. A hand mill was also found here. The deposition of miniature axes should be emphasised. The intensive use of the site ceased after the middle of the 3rd millennium BCE.

However, the deposits at the large standing stones show that the 3rd millennium BCE sanctuaries in Europe were preceded by an older practice of depositing artefacts at special sites. These sites can also be categorised as sanctuaries according to their structure and practices. The documented practices include in particular the depositing of stones, axes, millstones and pottery. The deposition of grinding stones is particularly noteworthy because they usually only occur in settlement contexts and occasionally in graves. Grinding stones were already deposited at Göbekli Tepe.

Large standing stones and later statue stelae were erected to mark places where ritual acts were performed, further small stones were laid down and stone axes, hand mills and ceramic vessels were placed. These objects functioned as offerings through which people could communicate with the imaginary powers. These were sacrifices, as described by Henri Hubert and Marcel Mauss in their ground-breaking study of the form and function of sacrifice:

"*The process consists of establishing communication between the sacred world and the profane world by means of a sacrificed object, i.e. an object that is destroyed in the course of the ceremony.*"

(Hubert and Mauss 1899/2012, 211)

The sacrifice is a mediator between the worshipper and the imaginary powers and prevents them from gripping the worshipper himself. One is giving something because one owes it to the gods or spirits and expects something in return. The material gifts were presumably only one part. The pottery finds indicate that food and drink offerings also played a role. The archaeological findings provide the decisive criteria for identifying these sites as sanctuaries.

In his last book Marshal Sahlins collected and presented the enchanted stories of immanentism. Sahlins argued that, in the axial time between the 8th and 3rd centuries BCE, the civilizations from Greece to China, a still ongoing transformation of divinity happened:

"*The essential change was the translation of divinity from an* immanent *presence in human activity to a* transcendental *'other world' of its own reality, leaving the earth alone to humans, now free to create their own institutions by their own means and lights*".

(Sahlins 2023, 2)

In immanent regimes, Sahlins pointed out, all significant material "things" are enspirited inasmuch as they embody animating powers with characteristics of persons (*ibid.*, 6–7). In these cultures of immanence, virtually anything and almost everything may be a non-human person: not only animals and plants, but stones, streams, winds, fire, sun, stars, cliffs (…) (*ibid.*, 75).

Using the example of the Sedna, Sahlins shows that rather anarchic peoples like the Inuit have been ruled by great gods since time immemorial. Sedna is the main deity of the Central Inuit. She has supreme power over the fate of the people. As the mother of sea animals, especially seals, whales and walruses, on which people depend for food, clothing, warmth and light and which are therefore the prerequisite for the existence of the Inuit, Sedna has a significant influence on the fate of the people (*ibid.*, 186). The role of Sedna and other mostly male species spirits is a double one: it protects, herds, watches over its animals, cares for them in various ways (*e.g.* 'counts' them, heals them, etc.) — but it can also hand over the animals of its species to the hunter as it pleases, send them to him, because it is regarded as the owner of its protégés. In these societies conviction is ruling that these powerful beings can order everything for the best of mankind, if only one behaves correctly towards them and the animal world.

Do these practices fit into the anmistic worldview and ritual practices? Yes, the spirits demand constant gifts and nourishment. In the case of the Khanty Peter Jordan states: "*… communication with the spirit world is only possible through sacrifice and gift giving*" (Jordan 2003, 137).

Regarding these Neolithic sanctuaries, archaeological excavations at the stones are needed, which should not only provide further details of the sacrifices, but also clarify the period of their use with the help of ^{14}C dating. After all, how could the Long Stone remain a "ritually" used place in many places without any archaeological traces having survived?

THE CHURCH AND THE POWER OF THE STONES

A good number of the large stones probably simply collapsed at some point. Other stones, however, remained part of the historical landscape and were possibly still "special places". A decisive turning point for the stones was the introduction of Christianity as the state religion under Emperor Theodosius I. From the 5th century onwards, the church was no longer concerned with simply separating itself, but with actively fighting non-Christian people, especially the Jews, but also the pagans (Hansen 2014).

The destruction of synagogues and their conversion into churches allows us to surmise parallel actions against pagan places. The destruction of non-ecclesiastical "holy" places was one of the tasks of the bishops in late antiquity. Pagan temples thus became the target of these "men of action". St Gallus (550–636) had to flee across Lake Zurich after setting fire to a temple in Thuggen and throwing cult images and implements into the water (Schwarz 2005, 255).

The destruction of cult images and the chopping down of sacred trees was a trademark of St Boniface ever since he felled the so-called "Donar's Oak" in Geismar in northern Hesse.

At various church councils between 465 and 615, regulations were issued that were directed against the pagans (Harmening 1979, 54–60). Several times, prohibitions were formulated not to sacrifice at springs, trees, and stones and to take vows there. The ecclesiastical sources show — regardless of whether they reflect a real event or merely repeat a well-known *topos* — that special places existed that were known to the general public as places of older cult practices. And these were evidently respected for a long time, as can be seen in numerous field names to this day.

In 658, the Council of Nantes ordered the removal of the large stones that continued to be worshipped by people in ruins and forests — "fooled by the teasing of demons" — and where they continued to take vows (Grimm 1877, 406: "*lapides quoque quos in ruinosis locis et silvestribus daemonum ludificationibus decepti venerantur, ubi et vota vovent et deferunt, funditus effodiantur atque in tali loco projiciantur ubi nunquam a cultoribus suis venerari possint*"; see Harmening 1979, 61). They were to be dug up completely and moved to a place where they could never again be worshipped by their followers. This avoided the destruction of the large stones. Burying menhirs may have been a method of removing the large stones from view, as determined by the Council of Nantes.

The finding in Görschen, Burgenlandkreis, can serve as an illustration of these regulations. When erecting scaffolding on the outer wall of the apse of the Protestant church of St Crucis in 2006, a large white stone (Fig. 8) made of lignite quartzite (*Braunkohlenquarzit*) was found. The stone was only covered by 20 cm of earth. The finding suggests that an agreement was sought here to remove the stone from the world, but in a prominent position. The worshipper looked at the altar, but also at the large Stone lying outside. This should not have happened before the 10th century at the earliest. Therefore, it has not been exposed to weathering for the last thousand years. It is

Fig. 8. Görschen, Burgenland district (Photos: Svend Hansen).

smooth on three sides and is heavily carved in relief in the presumed front view. It is probably a female figure. As longer working edges show, the stone has been deliberately moulded into a pillar-like shape and carefully smoothed and polished.

A particularly striking example of the coexistence of menhirs and churches is the standing stone in Langenstein, Kr. Marburg-Biedenkopf (Fig. 9), which stands 5.09 m above the ground and even gave the village its name. According to legend, Boniface had already built a chapel on this site. Today's Jakobskirche from the 13th century is located in the immediate neighbourhood. The Long Stone stands right next to the wall of the churchyard. The church arranged itself in this neighbourhood with the older cult monument.

Fig. 9. Langenstein, Kr. Marburg Biedenkopf (Photos: Svend Hansen).

Fig. 10. Standing stone near Pontusval (Men Marz), Dép. Finistère (Photos: Svend Hansen).

The archaeological findings illustrate the diagnosis of Sigmund Freud:

"(...) they (Germans and Slavs, SH) are all 'poorly baptised', under a thin layer of Christianity they have remained what their ancestors were, who paid homage to a barbaric polytheism." (Freud 1939/1994, 539)

Sigmund Freud concluded from this that they had not overcome their resentment against the new religion imposed on them, but instead shifted it to the source of Christianity, namely Judaism.

These findings were confirmed in 1929 by the Marburg classical philologist Ernst Maass with the following observations:

"And even if the ritual cult activity has ceased outwardly under coercion, inwardly the attitude has hardly changed, and ancient paganism continues in quite a few of the most endearing, deepest narrative motifs (...). The Heiligenstein monastery church near Ruhla has preserved its prehistory only in its name, but in it for all time." (Maass 1929, 5–6)

Numerous other examples could be cited.

In Brittany in particular, a number of Large Stones were "neutralised" with crosses. Nevertheless, such as the imposing 8.35 m high stone of Pontusval in Brignogan-Plages, Dép. Finistère (Fig. 10) are rather hybrid creatures with a message of their own. The large stones with their small crosses look like captured ships travelling under a foreign flag. Some of them may have been Christianised as early as the Middle Ages, others like the Pontusval stone as late as in the 18th century.

OUTLOOK

Large stones have been erected in Western Europe since the early 5th millennium BCE at the latest. From the second quarter of the 5th millennium BCE, they also took on the function of supporting stones in megalithic tombs. Instead of being destroyed or disempowered, they were integrated into an additional function. Other stones or alignments can be interpreted as early sanctuaries that served to communicate with the imaginary powers, the ancestors, or spirits, according to the excavation findings with numerous deposited offerings. It is an open question how the transformations of their function since the 3rd millennium BCE can be described. In any case, the Great Stones were the target of anti-pagan politics in late antiquity. In many places, they ultimately came to coexist peacefully with the church.

REFERENCES

Avner, U., 2001. Sacred stones in the desert. *Biblical Archaeology Review* 27, 30–41.

Avner, U. and Kolska Horwitz, L., 2017. Sacrifices and Offerings from Cult and Mortuary Sites in the Negev and Sinai, 6th–3rd Millennia BC. *Aram* 29, 35–70.

Bosinski, G., 1961. Der "Lange Stein" von Einselthum (Pfalz). Ein Menhir der Rössener Kultur? *Germania* 39, 171–185.

Bueno Ramírez, P., Piñón Varela, F. and Prados Torreira, L., 1985. Excavaciones en el Collado de Sejos (Valle de Polaciones. Santander). Campaña de 1982. *Noticiario Arqueológico Hispánico* 22, 27–53.

Cassen, S., Pétrequin, P., Boujot, C., Domínguez-Bella, S., Guiavarc'h, M. and Querré, G., 2011. Measuring distinction in the megalithic architecture of the Carnac region: from sign to material. *In:* M. Furholt, F. Lüth and J. Müller, *Megaliths and Identities Early Monuments and Neolithic Societies from the Atlantic to the Baltic 3rd European Megalithic Studies Group Meeting 13th–5th of May 2010 at Kiel University*, Frühe Monumentalität und soziale Differenzierung 1. Bonn: Habelt, 225–248.

Cassen, S., Lanos, P., Dufresne, P., Oberlin, C., Delqué-Kolic, E. and Le Gofic, M., 2015. Datations sur site (Table des Marchands, alignement du Grand Menhir, Er Grah) et modélisation chronologique du Néolithique morbihannais. *In:* S. Cassen, ed. *Autour de la Table. Explorations archéologiques et discours savants sur des architectures néolithiques à Locmariaquer, Morbihan,* Table des Marchands et Grand Menhir. Nantes: Laboratoire de recherches archéologiques, 737–768.

Cassen, S., Rodríguez-Rellán, C., Fábregas Valcarce, R., Grimaud, V., Pailler, Y. and Schulz Paulsson, B. 2019. Real and ideal European maritime transfers along the Atlantic coast during the Neolithic. *Documenta Praehistorica* 46, 308–325.

Caylus, A.C.P. de, 1764. *Recueil D'Antiquités, Egyptiennes, Etrusques, Grecques Et Romaines Et Gauloises*. Paris: Cicognara 2485F.
https://doi.org/10.11588/diglit.2633#0021

Dietrich, O., Dietrich, L. and Notroff, J., 2019. Anthropomorphic Imagery at Göbekli Tepe. *In:* J. Becker, C. Beuger and B. Müller-Neuhof, ed. *Human Iconography and Symbolic Meaning in Near Eastern Prehistory. Proceedings of the Workshop held at 10th ICAANE in Vienna, April 2016*. Wien: Akademie der Wissenschaften, 151–166.

Favre, S., Burri-Wyser, E., Chaix, L. and Weidmann, D., 2016. Lutry, les stèles-menhirs de La Possession. *In:* E. Burri-Wyser, ed. *Destins des mégalithes vaudois: Lutry, La Possession, Corcelles, Les Quatre menhirs et La Vernette, Concise, En Chenaux et Fin de Lance, Onnens, Praz Berthoud, fouilles 1984–2012, Cahiers d'archéologie romande 159*. Lausanne: Cahiers d'archéologie romande, 15–62.

Freud, S., 1939/1994. Der Mann Moses und die monotheistische Religion. *In: Studienausgabe Band IX Fragen der Gesellschaft,* Ursprünge der Religion 7. Frankfurt am Main: S. Fischer, 444–581.

Grimm, J., 1877. *Deutsche Mythologie. 4. Ausgabe, Bd. 3. Nachträge und Anhang.* Herausgegeben von E.H. Meyer. Gütersloh: Ferd. Dümmlers Verlagsbuchhandlung Harrwitz und Gossmann.

Grimm, J. and Grimm, W., 1877. *Deutsches Wörterbuch* 10. Leipzig: Hirzel.

Hansen, S., 2008. Bronzezeitliche Horte als Indikatoren für "andere Orte". *Das Altertum* 53, 291–314.

Hansen, S., 2012. Bronzezeitliche Horte: Zeitliche und räumliche Rekontextualisierungen. *In:* S. Hansen, D. Neumann and T. Vachta, eds. *Hort und Raum. Aktuelle Forschungen zu bronzezeitlichen Deponierungen in Mitteleuropa*, Topoi – Berlin Studies of the Ancient World 10. Berlin: De Gruyter, 23–48.

Hansen, S., 2014. Juden im römischen Reich: Eine archäologisch-historische Perspektive. *In:* R. Gross, S. Hansen, M. Lenarz and P. Rahemipour, eds. *Im Licht der Menora. Jüdisches Leben in der römischen Provinz*. Frankfurt am Main: Campus Verlag, 21–62.

Harmening, D., 1979. *Superstitio. Überlieferungs- und theoriegeschichtliche Untersuchungen zur kirchlich theologischen Aberglaubensliteratur des Mittelalters*. Berlin: Erich Schmidt Verlag.

Hubert, H. and Mauss, M., 1899/2012. Essay über die Natur und die Funktion des Opfers. *In:* M. Mauss, ed. *Schriften zur Religionssoziologie*. Berlin: Suhrkamp, 97–236.

Jeunesse, C., 2017. From Neolithic kings to the Staffordshire hoard: Hoards and aristocratic graves in the European Neolithic: The birth of a 'Barbarian' Europe?" *In:* P. Bickle, V. Cummings, D. Hofmann and J. Pollard, eds. *The Neolithic of Europe: Papers in Honour of Alasdair Whittle*. Oxford: JSTOR, 175–187.

Jordan, P., 2003. Material Culture and Sacred Landscape. The Anthropology of the Siberian Khanty. *Public Archaeology* 4(4), 276–280. https://doi.org/10.1179/pua.2005.4.4.276

Kofler, F., 1888. Die Hinkelsteine und Langesteine im Großherzogthum Hessen. *Korrespondenzblatt des Gesamtvereins der deutschen Geschichts- und Altertumsvereine* 36, 1888, 126–128.

Lagrost, L. and Buvot, P., 1996. Au carrefour de diverses influences: les menhirs ornés de Bourgogne du Sud. *In:* P. Duhamel, ed. *La Bourgogne entre les bassins rhénan, rhodanien et parisien: carrefour ou frontière?, Actes du XVIIIe Colloque interrégional sur le Néolithique, Dijon, 25–27 octobre 1991*. Dijon: Artehis Èditions, 415–435.

Large, J.-M., 2014. *La file de pierres dresées du Douet (Hoedic – Morbihan)*. Le Bourg: Melvan.

Large J.-M. and Mens, E., 2008. L'alignement du Douet à Hoëdic (Morbihan, France). *L'Anthropologie* 112, 544–571.

Leeuw, G. van der, 1956. *Phänomenologie der Religion* 2. Tübingen: J.C.B. Mohr.

Legrand d'Aussy, P.J.-B., 1799. *Mémoire sur les anciennes sépultures nationales et les ornemens extérieurs qui en divers temps y furent employés, sur les embaumemens, sur les tombeaux des rois francs dans la ci-devant église de Saint-Germain des Prés, et sur un projet de fouilles à faire dans nos Départements*. Mémoires de l'Institut national des sciences et arts, Sciences morales et politiques 2 (Fructidor VII). Paris, 411–680.

Le Roux, C.-T., Lecerf, Y. and Gautier, M., 1989. Les mégalithes de Saint-Just (Ille-et-Vilaine) et la fouille des alignements du Moulin de Cojou. *Revue archéologique de l'Ouest* 6, 5–29.

Maass, E., 1929. Heilige Steine. *Rheinisches Museum für Philologie N.F.* 78, 1–25.

Masserey, C., 1985. Un monument mégalithique sur les rives du Léman, *Archéologie suisse* 8, 2–7.

Oberrauch, H., 2019. Zum Ursprung der Brandopferplätze. *In:* S. Hye and U. Töchterle, eds. *UPIKU:TAUKE. Festschrift für Gerhard Tomedi zum 65. Geburtstag.* Bonn: Habelt, 435–456.

Pedrotti, A., Angelini, I., Artioli, G., Canovaro, C., Tecchiati, U. and Oberrauch, H., 2022. The Bell Beaker Rock Sanctuary Pigloner Kopf (South Tyrol, Italy): Burnt Offerings and Local Metallurgy in the Eastern Alps. *In:* C. Abegg, D. Carloni, F. Cousseau, E. Derenne and J. Ryan-Despraz, eds. *The Bell Beaker Culture in All its Forms. Proceedings of the 22nd Meeting of 'Archéologie et Gobelets' 2021 (Geneva, Switzerland).* Oxford: Archaeopress, 265–278.

Reinach, S., 1893. Terminologie des monuments mégalithiques. *Revue archéologique* 3, Serie 23(2), 35–48.

Renfrew, C., Boyd, M. and Bronk Ramsey, C., 2012. The oldest maritime sanctuary? Dating the sanctuary at Keros and the Cycladic Early Bronze Age. *Antiquity* 86(331), 144–160.

Le Rouzic, Z. and Keller, C., 1936. *La table des marchands: ses signes sculptés et ceux de la pierre gravée du dolmen de Mané-er-h'roëk*. Nantes: Albert Barbier.

Sahlins, M., 2023. *The New Science of the Enchanted Universe. An Anthropology of Most of Humanity*. Princeton: Princeton University Press.

Schwarz, P.-A., 2005. Spätantike Religion in der ehemaligen obergermanischen Provinz. *In: Imperium Romanum. Römer, Christen, Alamannen. Die Spätantike am Oberrhein*. Stuttgart: WBG, 251–262.

Soulages, P., 2002. Les statues-menhirs, des oeuvres d'art. Pour une lecture esthétique des statues-menhirs. *In:* A. Philippon, ed. *Statues-Menhirs des énigmes de pierre venue du fond des âges*. Rodez: Rouergue, 18–20.

Yates, D. and Bradley, R., 2010. The Siting of Metalworking Hoards in the Bronze Age of South-East England. *The Antiquaries Journal* 90, 41–72.

Two Currents of the Eneolithisation of Upland Loess Areas in the Northern Foreland of the Carpathian Mountains

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KEYWORDS: *flint retouched blade dagger, Eneolithic, warrior man, long blade blank, elite, prestige*

Abstract

Classification, whether a particular archaeological culture or region belongs to the Eneolithic period, should be determined by the presence of sources reflecting processes of profound socio-cultural and economic change, which significantly strengthened the role of male warriors in the communities or regions studied. These sources consist of prestige objects, mainly weapons made of copper and stone, including flint. By the mid-fifth millennium BCE at the latest, a network of inter-relationships between local centres of the Early Eneolithic had emerged, resulting in a standardisation of indicators typical of elite male warriors in a similar manner over vast territories, including the Eastern Balkans, the Carpathian Basin, the steppes of Eastern Europe and also the loess uplands north of the Carpathians. A long flint blade blank became an indispensable element of a wealthy male burial. The influence of the Early Eneolithic centres, around the decline of their existence around 4100 BCE, prompted the emergence of the Lublin-Volhynian culture north of the Carpathian Mountains. Two currents of Eneolithisation took part in the formation of the said cultural entity. One originated in the Bodrogkeresztúr culture from the Carpathian Basin, as evidenced by the adaptation of gender-differentiated funerary ritual rules and the style of the predominant copper items in the Lublin-Volhynian culture. The second strand originated from the Skelya culture, located in the steppes between the Dnieper and Don rivers, whose typical attribute is the retouched blade dagger with trough-shaped retouching.

Zusammenfassung

Die Einordnung einer bestimmten archäologischen Kultur oder Region in das Eneolithikum sollte auf der Grundlage von Quellen erfolgen, die tiefgreifende soziokulturelle und wirtschaftliche Veränderungsprozesse widerspiegeln, die unter anderem die Rolle der männlichen Krieger in den untersuchten Gemeinschaften oder Regionen deutlich gestärkt haben. Bei diesen Quellen handelt es sich um Prestigeobjekte, vor allem Waffen aus Kupfer und Stein, einschließlich Feuerstein. Spätestens um die Mitte des 5. Jt. v. Chr. hatte sich zwischen den lokalen Zentren des Frühneolithikums ein Beziehungsgeflecht herausgebildet, das zu einer Vereinheitlichung der für die männlichen Kriegerelite typischen Indikatoren führte, und zwar in ähnlicher Weise über weite Gebiete hinweg, einschließlich des östlichen Balkans, des Karpatenbeckens, der Steppen Osteuropas und auch der Lössplateaus nördlich der Karpaten. Die lange Klinge aus Feuerstein wurde zum unverzichtbaren Bestandteil reicher Männerbestattungen. Der Einfluss der früheolithischen Zentren gegen Ende ihres Bestandes um 4100 v. Chr. führte nördlich der Karpaten zur Entstehung der lublin-wolhynischen Kultur. Ihre Enststehung verdank sie wwei Strömungen des Eneolitikums. Zum einen der Bodrogkeresztúr-Kultur des Karpatenbeckens, was sich in der Adaption geschlechterdifferenzierter Bestattungsrituale und im Stil der Kupferobjekte der Lublin-Volhynien-Kultur widerspiegelt. Zum anderen der Skelya-Kultur, die in den Steppen zwischen Dnjepr und Don beheimatet ist und deren typisches Merkmal der retuschierte Klingendolch mit muldenförmigen Retuschen ist.

Podsumowanie

O tym czy daną kulturę archeologiczną lub określony region możemy zaliczyć do eneolitu powinna świadczyć obecność źródeł odzwierciedlających procesy głębokich zmian społeczno-kulturowych i ekonomicznych, których efektem było znaczne wzmocnienie roli mężczyzn-wojowników w badanych społecznościach. Te źródła to przedmioty prestiżowe, głownie broń z miedzi, kamienia, w tym z krzemienia. Najpóźniej w połowie V tys. BCE pojawiła się sieć wzajemnych powiazań między lokalnymi ośrodkami wczesnego eneolitu, skutkiem czego nastąpiło ujednolicenie sygnalizowania przynależności do elit mężczyzn wojowników w podobny sposób na rozległych obszarach łącznie ze wschodnimi Bałkanami, Kotliną Karpacką, stepami wschodniej Europy a także na wyżynach lessowych na północ od Karpat. Niezbywalnym elementem bogatego pochówku mężczyzny stał się długi wiór krzemienny. Rezultatem oddziaływań centrów wczesnego eneolitu, u schyłku jego istnienia ok. 4100 BCE było powstanie kultury lubelsko-wołyńskiej na północ od Karpat. Złożyły się na to dwa nurty eneolityzacyjne. Jeden wychodził ze środowiska kultury Bodrogkeresztúr z Kotliny Karpackiej o czym świadczy adaptacja reguł zróżnicowanego względem płci obrządku pogrzebowego i stylistyka przeważającej części wyrobów miedzianych w kulturze lubelsko-wołyńskiej. Drugi nurt wychodził z kultury Skelya na stepach między Dnieprem a Donem, dla którego typowym atrybutem był wiórowiec-sztylet ukształtowany retuszem rynienkowatym.

INTRODUCTION

This paper aims to outline the two currents in the Eneolithisation of the loess upland areas north of the Carpathian Mountains (Fig. 1) at the turn of the 5th to the 4th millennium BCE, which resulted in the formation of the L-VC.[1] This culture is included in the Eneolithic milieu due to the presence of copper artefacts and stone products, including flint objects, of a symbolic and prestigious nature in its inventories. When defining the Eneolithic, certain stone artefacts have been attributed a status equal to copper artefacts. This arises from an analysis of the grave inventories of rich male interments, where weapons made of copper and stone are repeatably present side by side.

Therefore, it is necessary to go beyond the raw material criterion, i.e. the presence of copper, in defining the Eneolithic. This, however, poses many difficulties in characterising cultures from that period. The decisive criterion in defining the Eneolithic character of an archaeological culture are the complex cultural and socio-economic changes, among which the most significant was the noticeable strengthening of the importance of the male warriors in society (Kadrow 2015, 248–249; Neustupný 2008, 11).

RICH MALE GRAVES IN THE EARLY ENEOLITHIC – GLOBAL REGULARITIES AND LOCAL PECULIARITIES

The most effective way to confirm the Eneolithic character of the culture in question is to analyse the structure of the inventories of rich male graves together with selected elements of the funerary rite. As an example, let us use grave no. 5 from the cemetery at site 2 in Książnice, which is within the western zone of the L-VC range (Fig. 1). In this burial, three vessels, a copper axe, a retouched blade dagger made of Volhynian flint and formed with a trough-like retouch, three blade blanks, and ten other flint artefacts were deposited. An elderly man (*Senilis*) was buried in this grave on his right side, his head pointing to the south and his face turned to the east (Wilk 2006; Zakościelna 2006).

The cemetery of Strzyżów is located in the eastern part of the L-VC area. At site 26, grave no. 1 was discovered in which one pottery vessel, two retouched blade daggers made of Volhynian flint and formed with a trough-like retouch, one retouched blade, one blade, and one copper dagger were deposited. Additionally, there were also fragments of copper wire. In this grave,

1 Abbreviations of culture names used in the text:
BGC: Bodrogkeresztúr Culture;
CTCC: Cucuteni-Trypillia Cultural Complex;
GC: Gumelniţa Culture;
KGK VI: Kodjadermen-Gumelniţa-Karanovo VI-Varna Cultural Complex;
MC: Malice Culture;
LC: Lengyel Culture;
L-VC: Lublin-Volhynian Culture;
SC: Skelya Culture;
TPC: Tiszapolgár Culture.

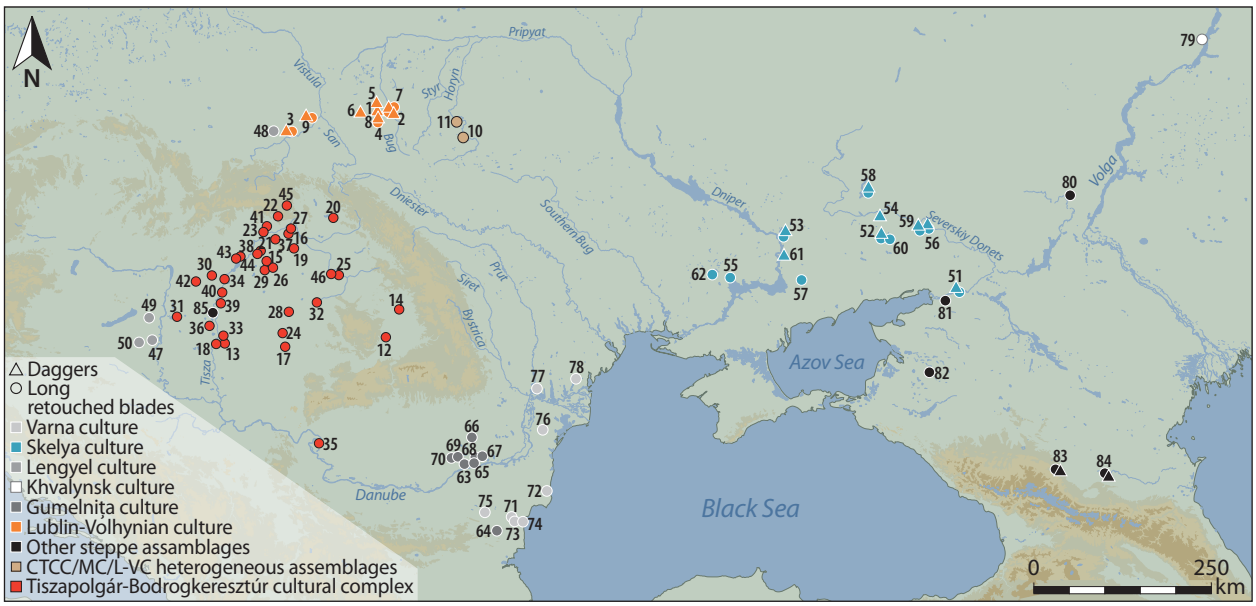


Fig. 1. Eneolithic burial inventories with retouched blades. ***Lublin-Volhynian culture (orange)****: 1 Gozdów 1, Hrubieszów District, Lublin Province; 2 Gródek 1A, 1C, Hrubieszów District, Lublin Province; 3 Książnice 2, Busko District, Świętokrzyskie Province; 4 Mikulin 8, Tomaszów District, Lublin Province; 5 Moniatycze Kolonia 1, Hrubieszów District, Lublin Province; 6 Sitaniec-Wolica 3, Zamość District, Lublin Province; 7 Strzyżów IA, 2A, 26, Hrubieszów District, Lublin Province; 8 Tyszowce 3, Tomaszów District, Lublin Province; 9 Złota „Grodzisko II", Sandomierz District, Świętokrzyskie Province (PL).* ***CTCC/MC/L-VC heterogeneous assemblages (beige)****: 10 Ostrog-Zeman, Ostrog Rayon, Rivne Oblast; 11 Rivne Stepova str., Rivne Rayon, Rivne Oblast (UA).* ***Tiszapolgár-Bodrogkeresztúr cultural complex (red)****: 12 Decea Mureșului, Mirăslău Commune, Alba County (RO) 13 Deszk B, Csongrád County (H); 14 Feldioara I, Cătina Commune, Cluj County (RO); 15 Hajdúböszörmény-Ficsori-tó dűlő, Haydú-Bihar County; 16 Kisvárada, Szabolcs-Szatmár-Bereg County (H); 17 Pecica-Est, Arad County (RO); 18 Sprsky Krstur, Novi Kneževac Commune (SRB); 19 Szablocs, Szabolcs-Szatmár-Bereg County (H); 20 Tibava, Sobrance District, Koshyce County (SK); 21 Tiszapolgár-Basatanya, Haydú-Bihar County (H); 22 Vel'ke Raškovce, Michalovce District, Košice County (SK); 23 Bodrogkeresztúr, Borsod-Abaúj-Zemplén County; 24 Battonya „31 Kútkörzet", Békés County (H); 25 Cămin I, Casmicea Commune, Tulcea County (RO); 26 Debrecen, Hajdú-Bihar County; 27 Fényeslitke, Szabolcs-Szatmár-Bereg County; 28 Gyula-Sándorhegy, Békés County; 29 Hajdúszoboszló, Hajdú-Bihar County; 30 Jászladány, Jász-Nagykun-Szolnok County; 31 Kiskőrös, Bács-Kiskun County; 32 Magyarhomorog-Kónyadomb, Haydú-Bihar County; 33 Maroslele, Csongrád County; 34 Nagykörü-Hidashát, Jász-Nagykun-Szolnok County (H); 35 Ostrovul Corbului-Botul Cliuciului, Hinova Commune, Mehedinți County (RO); 36 Ópusztaszer, Csongrád County; 37 Paszab-Hordozódülő, Szabolcs-Szatmár-Bereg County; 38 Polgár-Bacsókert, Haydú-Bihar County; 39 Pusztaistvánhaza, Jász-Nagykun-Szolnok County; 40 Rákóczifalva-Bivaly-tó Site 1/C, Jász-Nagykun-Szolnok County; 41 Sárazsadány, Borsod-Abaúj-Zemplén County; 42 Tápiószentmárton, Peszt County; 43 Tiszavalk-Kenderföld, Borsod-Abaúj-Zemplén County; 44 Tiszavalk-Tetes, Borsod-Abaúj-Zemplén County (H); 45 Šebastovce, Košice County (SK); 46 Urziceni, Urziceni Commune, Satu Mare County (RO).* ***Lengyel culture (gray)****: 47 Alsónyék-Kanizsa, Tolna County (H); 48 Dziekanowice 1, Pińczów District, Świętokrzyskie Province (PL); 49 Lengyel, Tolna County; 50 Zengóvárkony, Pécsvárad District, Baranya County (H).* ***Skelya culture (blue)****: 51 Aksaj „Muhin II", Aksaj Rayon, Rostov Oblast (RUS); 52 Čapli, Dnipro Rayon, Dnipro Oblast; 53 Igren´ (Staraâ Igren´), Novomoskovsk Rayon, Dnipro Oblast; 54 Jama, Bahmut Rayon, Doneck Oblast; 55 Kut, Kryvyi Rih Rayon, Dnipro Oblast; 56 Lugansk, Lugansk Rayon, Lugansk Oblast; 57 Novodanylivka, Orykhivsk Rayon, Zaporizhzhya Oblast; 58 Oleksandriâ, Kupyansk Rayon, Kharkiv Oblast; 59 Oleksandrivs´k, Lugansk Rayon, Lugansk Oblast; 60 Orlivs´ke, Volnovakha Rayon, Doneck Oblast; 61 Petro Svistunove, Zaporizhzhya Rayon, Zaporizhzhya Oblast; 62 Shyroke, Kryvyi Rih Rayon, Dnipro Oblast (UA).* ***Gumelnița culture (dark gray)****: 63 Chirnogi I, Chirnogi Commune, Călărași County (RO); 64 Goljamo Delčevo, Varna Oblast (BG); 65 Gumelnița II, Oltenița Town, Călărași County; 66 Măriuța II, Belcigatele Commune, Călărași County; 67 Sultana-Malu Roșu II, Mânăstirea Commune, Călărași County; 68 Ulmeni, Călărași County; 69 Vărăști B, Dorobanțu Commune, Călărași County; 70 Vidra, Vidra Commune, Ilfov County (RO).* ***Varna culture (light gray)****: 71 Devnja Poveljanovo, Varna Rayon, Varna Oblast; 72 Durankulak, Shabla Rayon, Dobrich Oblast; 73 Reka Devnja, Devnja Rayon, Varna Oblast; 74 Varna I, Varna Rayon, Varna Oblast; 75 Vinitsa, Varbitsa Rayon, Shumen Oblast (BG). Cernavoda I culture: 76 Casimcea, Casmicea Commune, Tulcea County (RO); Suvorovo group: 77 Giurgiulești, Vulcănești Rayon (MD); 78 Suvorove, Izmail Rayon, Odessa Oblast (UA);* ***Khvalynsk culture (white)****: 79 Khvalynsk, Khvalynsk Rayon, Saratov Oblast (RUS).* ***Other steppe assamblages (black)****: 80 Shlakhovskiy Khutor, Frolov Rayon, Volgograd Oblast; 81 Koysug, Azov Rayon, Rostov Oblast; 82 Baturinskaya, Briukhovec Rayon, Krasnodar Krai; 83 Veselaya Roshcha Khutor, Aleksandrovsk Rayon, Stavropol Krai; 84 Komarovo, Mozdok Rayon, North Ossetia-Alania County (RUS); 85 Csongrád, Csongrád County (H) (Graphic: Elena Starkova; map: Karin Winter).*

an adult male (*adultus*) was interred on his right side with his head pointing to the south (Zakościelna 2010, 295–296 table LXI).

There is a structural similarity between the inventories of graves of men of higher social status among the cultures of Southeast Europe, the Carpathian Basin (Klimscha 2016, 240) and the Eastern European steppes (Govedarica and Manzura 2019) as well as on the loess uplands north of the Carpathian Mountains (Zakościelna 2010). Rich male graves at Varna have copper shaft-hole axes and axes, long flint blade blanks, and gold artefacts (Ivanov 1988a; Ivanov 1988b). Grave 10/56 at Tibava, belonging to the TPC, contains 19 pottery vessels, nine small blanks, one long blade blank, a copper shaft-hole axe, a stone axe, a copper bracelet, and a gold disc (Šiška 1964, 305–306 fig. 15.6–32). The grave of a 'prince' of the LC at Alsónyék (grave 3060) contains six pottery vessels, one shaft-hole stone axe and two axes, as well as three long blade blanks, ornaments made of copper, and *Spondylus* and *Dentalium* shells (Zalai-Gaál 2008, 270–272 fig. 14).

A long blade blank is an indispensable element of a wealthy male grave inventory in the areas of Europe mentioned above (Klimscha 2016, 240). Shaft-hole axes and axes made of either copper or stone are also common. A clear impoverishment of the grave inventories in question can be seen when proceeding from south to north, from the western shore of the Black Sea, through the Carpathian Basin up to the Lesser Poland Uplands and Volhynia (*e.g.* Wilk 2018, 491–492). There is more copper in the south and more stone in the north. Similarly, the length of the blade blanks decreases. In Varna, they sometimes exceed 40 cm in length (Manolakakis 2005), while within the L-VC, they rarely reach 20 cm. Nevertheless, the structural pattern of rich male grave goods is the same throughout the analysed area (Fig. 1). This may indicate that regular communication between communities and a similar value system was functioning within the said region (Klimscha 2016, 240).

From a pan-European perspective, the extent of the occurrence of long blade blanks, as well as copper and stone shaft-hole axes and axes in graves, is roughly the same. Both categories of artefacts were particularly intensively deposited in the Carpathian Basin and in the Lower Danube area (Fig. 1; Klassen *et al.* 2011, 16–17 fig. 7). They are also present in the Pontic, Azov and Volga steppes and areas north of the Carpathian Mountains, though more dispersed. The spread of these artefacts mentioned above supports the hypothesis that a network of intensive interactions and contacts existed within this vast area.

A peculiarity can be observed in the male graves of the L-VC, with one exception of the burial of a woman in Gozdów (Zakościelna 2010, 245–246), namely the deposition of retouched blade daggers made of

Fig. 2. Retouched blades daggers of the L-VC. ***1*** *Gródek 1C burial 2/1987;* ***2*** *Książnice 2, burial 5 (after: Zakościelna/Libera 2013, 282 fig. 5, modified).*

Volhynian flint and formed with trough-like retouch (Fig. 2). Apart from the steppe SC, and two sites in the Caucasus foreland, they are not found in the inventories of other archaeological cultures (Fig. 1).

In a few graves, the retouched blade daggers lay on the chest of the deceased. In grave 5 from Książnice 2 (Wilk 2006, 248), it was placed on the ribs under the left humerus. The proximal end of the retouched blade was polished on both sides, probably from the shafting. Other traceological traces indicate that the retouched blade was placed in a scabbard (Wilk and Kufel-Diakowska 2016, 157–160). In grave 2/1987 from Gródek 1C, two retouched blade daggers were found on the chest of a man interred there (Mączyński *et al.* 2023, 485, 491 fig. 3; 4.1, 5).

Similarly, viz. on the chest, bronze daggers were worn at slightly later times in the Cernavoda III culture (*e.g.* Casini 1998, 279 fig. 5; Roman 2001, 42 fig. 16.12, plate 1). Therefore, it can be concluded that retouched blades with trough-like retouching also functioned as daggers (Zakościelna 2008, 587). The results of traceological analyses indicate that some of the retouched blade daggers do not show any traces of working (Mączyński *et al.* 2023, 6), while on others, such traces were observed (Wilk and Kufel-Diakowska 2016, 157–160).

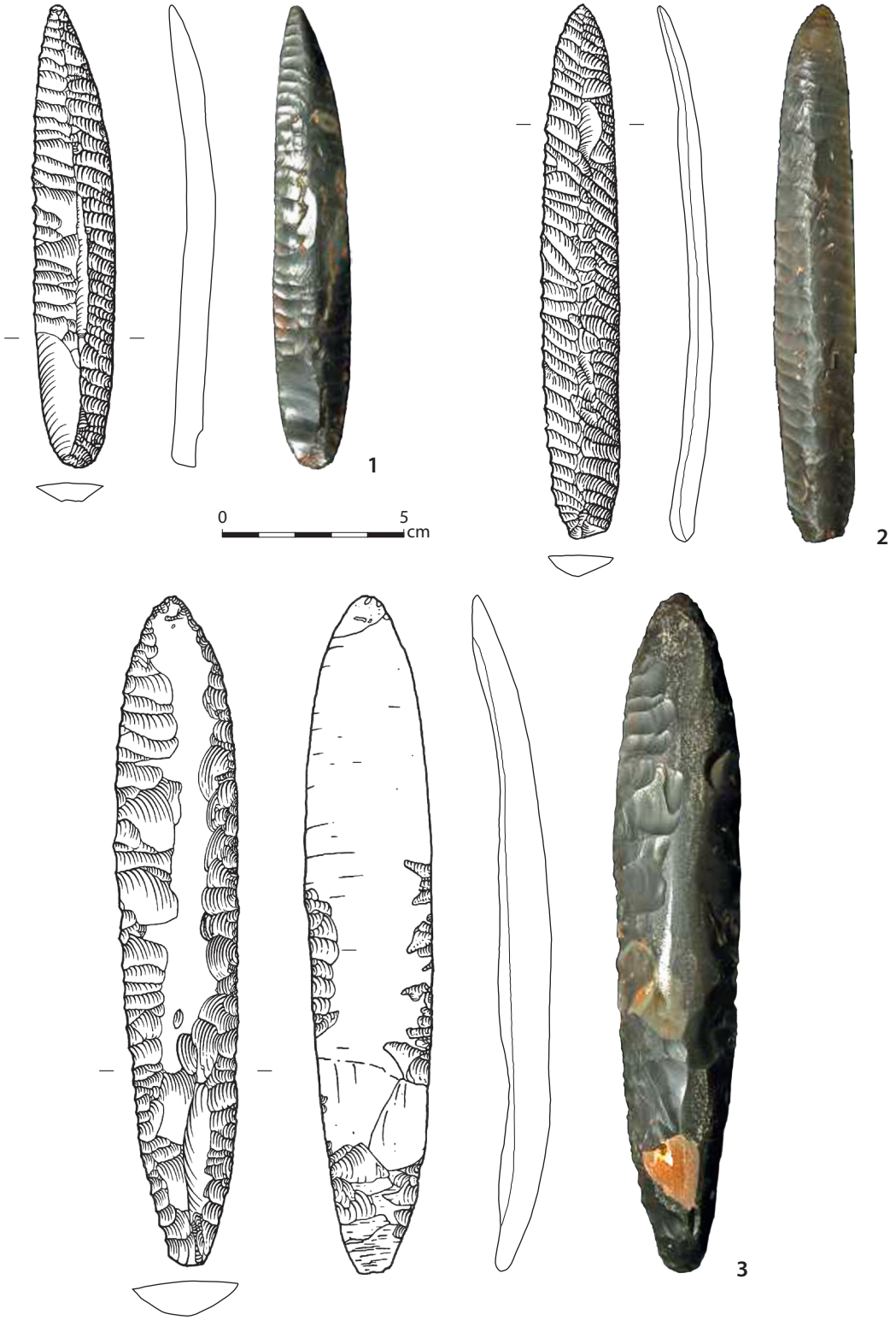


Fig. 3. Retouched blades daggers of the SC. Lugansk (after: Kadrow/Zakościelna 2022a, 164 fig. 5; graphic editing by Elena Starkova, Karin Winter).

In our opinion, the presence of wear marks does not detract from the prestigious role of these exclusive objects. It is because the right to possess such retouched blade daggers was what mattered, and this right was exclusively given to a small group of high-ranking adult male warriors. Hence, they were the only ones who could use

these retouched blades for various symbolic and ritual activities (Mączyński and Zakościelna 2017, 348–349).

The blade blanks from which the retouched blade daggers were formed had been obtained by a pressure blade removal technique, probably using a lever. They have side edges parallel to their axis and a uniform thickness throughout their length. Their dimensions measure 154–219 mm in length and 26–39 mm in width. The converging or end-scraped-shaped distal ends of these retouched blade daggers were formed with a trough-like retouch, viz. in the same way as the side edges (Zakościelna 2008, 578).

In the steppe SC, retouched blade daggers formed with trough-like retouch (Fig. 3) were produced from local Cretaceous flint of excellent quality, quarried by the Severskiy Donets River in Eastern Ukraine (Kadrow and Zakościelna 2022a, 161 fig. 2; Kolesnik 2019, 604–614 fig. 1). At times, these retouched blade daggers reached a length of just over 250 mm (Rassamakin 2004, 95 fig. 77.3, 4).

The retouched blade daggers discussed here have three important characteristics:

a) they were made from blade blanks of considerable length and obtained by a specific technology for their removal,
b) they were then formed by trough-like retouching to shape their distal ends and sides, and
c) they functioned as daggers, viz. one of the prestigious components of rich male grave inventories. Each of these features is visible in the grave assemblages of the SC.

The SC dates to the period from 4700 to 4100 BCE (Rassamakin 2004, 182–183), while the L-VC dates to 4050–3700 BCE (Wilk 2018, 492). In light of the absolute chronology of both cultures, the direction of influence is evident. The disappearance of the former culture before the emergence of the latter, however, prompts the search for an intermediary in the process of transferring knowledge about the symbolism and technology of the production of these daggers.

The CTCC by the Upper and Middle Dniester, at the end of its BI phase and during the BI-BII phase, was the intermediary in the transfer of the trough-like retouch from the steppe zone to Volhynia, viz. the eastern part of the L-VC range (Kadrow and Zakościelna 2022, 166–178 fig. 1). The same was probably true for the transfer of the long blade blank concept. In both cases, the involvement of another intermediary, namely the late MC that is the immediate predecessor of the L-VC in the eastern part of its range, cannot be excluded (Kadrow and Zakościelna 2022a, 171–173, 182; Zakościelna 1996, 103–104).

What remains problematic, however, is the transmission mechanism of the idea of the retouched blade daggers with its entire symbolic-prestigious context. Until now, rich male graves with inventories typical of the Early Eneolithic cultures in Southeastern, Eastern, and Central Europe are unknown from the CTCC (Fig. 1). Therefore, this cultural complex could not have been an intermediary of this concept. Neither could the late MC population have been the intermediary, which lacks retouched blade daggers in its inventories and reveals no symptoms of social hierarchisation.

After the hiatus period on the steppes, viz. 4100–3900 BCE (Rassamakin 2004, 182–183), long blade blanks were no longer deposited in graves. Therefore, the origin of the L-VC in Volhynia should perhaps be shifted to c. 4200 BCE (Kadrow and Zakościelna 2022, 180–182). Then, the retouched blade daggers would have been transferred directly from the SC to the L-VC. However, there is currently no evidence to support this.

THE CURRENT OF ENEOLITHISATION FROM THE POLGAR CIRCLE CULTURAL MILIEU OF THE CARPATHIAN BASIN

The local nature of pottery production in the L-CV supports the thesis that the nature of Eneolithisation from the south was a result of cultural influence rather than migration. This process manifested itself most strongly in the adaptation of gender-differentiated funerary rites, which have eminent Polgar traits (Häusler 1994). The inventories of copper artefacts, although poor when compared to the Balkans and the Carpathian Basin, contain specimens mostly of Polgarian provenance, e.g., Şiria-type hammer axes (Wilk 2004, 229 fig. 13) and axes with a fan-shaped blade (Wilk 2006, 248 fig. 7). Less culturally 'sensitive' are copper ornaments, although equivalents for most jewellery designs can also be found within the Polgar milieu. The structure of the inventories of the rich male graves (shaft-hole axe, axe, long blade blank) refers to the Eastern Balkans but was probably also borrowed directly from the Polgar circle. The beginning of Eneolithisation from a southern direction probably took place at the very end of the 5th millennium BCE, towards the end of the development of phase II of the BGC (Wilk 2018, 492).

GENDER-DIFFERENTIATED FUNERAL RITES

The unification of rules for equipping rich male graves throughout the discussed area was not followed by the unification of other elements of the funerary rites. The earliest manifestations of comprehensively gender-differentiated funerary rites are recorded at the end of the Hamangia culture and in the Varna culture, in burials at cemeteries separated from settlements (Häusler 1994; Lichter 2001). Men were interred in an extended supine position, while women were in a flexed position on their right side (Todorova 2002a), although some of the deceased males were buried in a position typical of women. Weapons and tools were deposited in men's graves (Borić 2015, 939).

With the beginning of the TPC, the oldest of the Polgar circle cultures, the custom of burying the dead at cemeteries appeared within the Carpathian Basin. Women were interred in graves in a flexed position on the left side, while men were placed on the right side. The inventory of the graves also emphasised gender differences. Copper shaft-hole axes and axes, long flint blade blanks, boar tusks, and gold pendants were deposited in men's graves, while copper ornaments were placed in women's graves. Beads of shell, copper and limestone are found in the graves of both sexes. These customs continued in the BGC (Lichter 2001; Nevizánsky 1984). Very similar funerary rites were also present in the L-VC, especially in its developed and late phase of development (Zakościelna 2010, 197–218). However, in the Hunyadi-halom culture, numerous cremation burials appeared with very limited copper and flint inventories (Borić 2015, 492–494).

In the GC, 80% of the dead were interred on the left side regardless of gender, but stone axes are only found in male graves (*ibid.*, 941). In the LC (Brodzany, Nitra, and Ludanice groups) as well as in the Balaton-Lasinja culture, the predominance of graves located within settlements is noted. There is also a lack of consistent observance of the gender-differentiated arrangement of the dead in burial pits (*ibid.*, 944).

In the SC and Khvalynsk cultures of the steppe, the dead of both sexes were buried in a supine position with their legs contracted at the side and in a variety of other arrangements (Agapov 2010; Agapov *et al.* 1990; Anthony *et al.* 2022; Rassamakin 1999). The burials of men of both cultures included long blade blanks, retouched blades, flat stone and flint axes, flint cores, bifacial triangular blades, copper shaft-hole axes, stone maces/scepters and copper bracelets. In addition, retouched blade daggers formed with trough-like retouch are known in the SC. In contrast, small ornaments, including copper ones, dominate in women's graves.

TWO CURRENTS OF ENEOLITHISATION OF THE L-VC IN THE CONTEXT OF THE DYNAMICS OF SOCIO-CULTURAL AND ECONOMIC DEVELOPMENT IN EUROPE

In the approach adopted to describe the Eneolithic, the achievement of a certain stage of complex cultural and socio-economic changes is considered to be of crucial importance. The most important of these is the marked strengthening of the role of the male warrior in the community. Thus, we consider the process of Eneolithisation to be such a set of changes that manifest themselves in an archaeologically tangible manner as the appearance of rich male graves with a specific inventory structure.

In the fully implemented structure pattern, copper and/or stone shaft-hole axes and axes, as well as long flint blades are present. In peripheral areas, *e.g.* in the loess uplands north of the Carpathian Mountains, where the L-VC developed, specimens of the weaponry mentioned above are much rarer than in the Eastern Balkans and the Carpathian Basin. Within the L-VC, there are no stone shaft-hole axes or axes. Instead, isolated specimens of these artefacts made of copper are encountered. Moreover, the quadrilateral flint axes are absent even though they are often found in non-burial contexts in the GC and CTCC, where large specimens acted as indicators of prestige (Klimscha 2016, 244–245).

The L-VC seems to meet the criteria of belonging to the Early Eneolithic world mainly due to the presence of rich male graves with the appropriate set of grave goods containing, among other things, long blade blanks (see Fig. 1 and Fig. 2). At the same time, the peripheral nature of the culture is apparent, as evidenced by the small and undifferentiated inventory of copper items and the smaller average size of the long blade blanks.

The presence of copper and bone daggers (Zakościelna *et al.* 2023) as well as retouched blade daggers formed with trough-like retouch (see Fig. 1), seems to be the distinctive feature of this culture. The greatest peculiarity of the L-VC, however, is its position on the timeline. It did not commence until *c.* 4050 BCE when the Early Eneolithic cultures, to which it structurally belongs, had already ceased to exist for a long time: Varna culture 4450 BCE; Khvalynsk culture 4300 BCE; GC 4200 BCE; SC 4100 BCE. The BGC is an exception in this regard, as it lasted until 4070 BCE. In contrast,

the Hunyadi-halom culture (4020–3780 BCE), which is contemporary with the L-VC, does not continue the Early Eneolithic traditions in this respect, due to the changes in the burial rites and the lack of manifestations of inequality, especially the absence of rich male graves and a high proportion of cremations.

Yuri Rassamakin believes that the network of interconnections of the Early Eneolithic period was based on the exchange of prestige items. This exchange was concentrated in the hands of elites of the SC. They mediated between the steppe communities, the CTCC, the Balkans, and the Danubian world. Moreover, the foreland of the Caucasus was included in this system, while the Khvalynsk culture on the Lower Volga formed a peripheral zone of consumption. The SC elites were in direct contact with the KGK VI, where the starting point for the exchange of prestige items was located (Rassamakin 1999, 111–112 fig. 3.42; Todorova 2003).

By contrast, other researchers point to the key role of the Suvorovo group of the steppe and Eastern Balkan borderlands as the intermediary in the transmission of prestige objects, socio-organisational and technological ideas from the KGK VI eastwards as far as the Lower Volga and into the CTCC milieu (Govedarica and Manzura 2019, 34). Among researchers, there are supporters of the thesis of the hierarchic (Ivanov 1988a; Lichardus 1991) or the heterarchic nature of the Varna culture community (Chapman *et al.* 2006). Regarding the origins of this culture, there are proponents of migration from the steppes (Ivanov 1988a; Lichardus 1991) or local ancestry (Kadrow 2011; Todorova 2002b).

The system was fully operational between 4500 and 4200 BCE. Studies of the KGK VI dynamics indicate that it emerged around 4600/4550 BCE, and the demographic boom occurred between 4450 and 4350 BCE. Then, the prolonged decline began circa 4150 and ended in 3800 BCE (Popescu *et al.* 2023, 16-17 fig. 3).

The decline of the GC by the Lower Danube was accompanied by the rapid growth of the CTCC population in Moldova and by the Middle and Upper Dniester in Ukraine, evident from *c.* 4100 BCE onwards (Diachenko and Harper 2016, 91; Harper 2019, 973–982). At the same time, inventories of the BII stage of the TPC appear (Harper 2021, 66–72 figs. 1, 2).

Close contacts between the steppe and the CTCC communities already began at the end of the latter's phase A, i.e. around 4700–4600 BCE. During the BI-BII phase, after 4500 BCE, the CTCC population spread from overpopulated Moldova to the area between the Dniester and Dnieper rivers (Nikitin *et al.* 2023, 2). After the collapse of the Early Eneolithic cultures, viz. from *c.* 4200 BCE, the push of the Serednii Stih population from the steppe northwards to the forest-steppe along the Dnieper Valley began, bringing them into contact with the CTCC communities (*ibid.*, 2).

The Kolomiytsiv Yar Tract settlement with the BI-BII phase materials of the CTCC also revealed pottery with shell temper, imported from the steppe as well as made locally. Human remains from this site, dating to 4049–3945 BCE, came from the Middle Dnieper Valley from the Serednii Stih cultural milieu. This demonstrates the practice of genetic interaction between steppe communities and the CTCC groups as early as the turn of the 5th to the 4th millennium BCE (*ibid.*, 7–11).

In the Upper Styr and Horyn basin in Volhynia, where a relatively intense settlement of the late phase of the MC and the L-VC is recorded, the CTCC population from the BII phase appears. The absolute chronology of this phase lies within the period 4000–3800 BCE, which is confirmed by the few radiocarbon dates for the local Trypillian settlement (Pozikhovskyi and Karski 2020, 78–90). Other scholars postulate that the beginning of phase BII should be dated to 4100 BCE, at least for the west Trypillian groups (*e.g.* Harper 2021, 70 fig. 2).

The presence of heterogeneous grave inventories within this area, combining Late MC and Tripillian features (Ostrog-Zeman) with Polgarian features (Rivne, Stepova Street) and, in Holishiv, the MC features with the L-VC features (Kadrow and Zakościelna 2022b) allows us to assume at least a brief parallel development of the Late MC, the beginnings of the BII phase of the CTCC as well as contacts with the Late SC, no later than 4100 BCE, for only then could the synthesis of the aforementioned elements have occurred and the eastern variant of the L-VC developed on its basis.

After the collapse of the Early Neolithic contact network and during the hiatus on the steppe (between 4100 and 3900 BCE), the peripheral, heterogeneous and multicultural entities, such as the settlement agglomeration mentioned above from the Upper Styr and Horyn basins, gained development opportunities. Hybrids destroy cultural boundaries and are instrumental in the creation of new identities and the emergence of new cultures (Barker 2005, 195–197).

The formation of the L-VC within the eastern part of its range was heavily influenced by the adoption of the concept of the retouched blade dagger formed with trough-like retouch from the SC, and hence the consequent strengthening of the social position of men in the communities. Thus, the Eneolithisation from the steppe further linked the L-VC communities to the ideas of the Early Eneolithic cultural milieu. This happened at the last possible moment, when the network of connections had ceased to function.

Considering the identity of the L-VC community, the Eneolithic current from the Carpathian Basin, dating to the late BGC phase, probably played the more important role. The funerary rites in their full form were adopted from there. These rituals are strongly

linked with the identity of the group (Drummer 2022, 17). The presence of rich male graves, equipped with specimens of copper weapons, signalling the beginnings of hierarchisation and inequality within the L-VC, especially within its western part, proves the existence of a second current of Eneolithisation, this time from the area located by the Tisza River.

REFERENCES

Agapov, S.A., ed., 2010. *Khvalynskie eneoliticheskie mogil'niki i Khvalynskaya Eneoliticheskaya kul'tura: Issledovaniya materialov*. Samara: "Povolzh'e".

Agapov, S.A., Vasilev, I.B. and Pestrikova, V.A., 1990. *Khvalynskiy eneoliticheskiy mogil'nik*. Saratov: Izdatelstvo Saratovskogo Universiteta.

Anthony, D.W., Khokhlov, A.A., Agapov S.A., Agapov, D.S., Schulting, R., Olalde, I. and Reich, D., 2022. The Eneolithic cemetery at Khvalynsk on the Volga River. *Praehistorische Zeitschrift* 97(1), 22–67.

Barker, C., 2005. *Studia kulturowe. Teoria i praktyka*. Kraków: Wydawnictwo Uniwersytetu Jagiellońskiego.

Borić, D., 2015. Mortuary practices, bodies and persons in the Neolithic and Early-Middle Copper Age of southeast Europe. *In:* C. Fowler, J. Harding and J.D. Hofmann, eds. *The Oxford Handbook of Neolithic Europe*. Oxford: Oxford University Press, 927–957.

Casini, S., 1998. Analisi Analisi delle figure di asce sulle stele della Valcamonica e Valtellina (stile III A). *In:* J. Guilaine, ed. *Actes du 2eme Colloque International sur la Statuaire Mégalithique. Saint-Pons-de-Thomières du 10 au 14 septembre 1997*, Archéologie en Languedoc 22. Saint-Pons-de-Thomières: Lattes, 273–284.

Chapman, J., Higham, T., Slavchev, V., Gaydarska, B. and Honch, N., 2006. The The social context of the emergence, development and abandonment of the Varna cemetery, Bulgaria. *European Journal of Archaeology* 9(2–3), 159–183.

Diachenko, A. and Harper, T.K., 2016. The absolute chronology of Late Tripolye sites: a regional approach. *Sprawozdania Archeologiczne* 68, 81–105.

Drummer, C., 2022. *Vom Kollektiv zum Individuum. Transformationsprozesse am Übergang vom 4. zum 3. Jahrtausend v. Chr. in der deutschen Mittelgebirgszone*, Scales of Transformation in Prehistoric and Archaic Societies 13. Leiden: Sidestone Press.

Fol, A. and Lichardus, J., eds., 1988. *Macht, Herrschaft und Gold. Das Gräberfeld von Varna (Bulgarien) und die Anfänge einer neuen europäischen Zivilisation*. Saarbrücken: Saarland-Museum Moderne Galerie.

Govedarica, B. and Manzura, I.,2019. The Giurgiuleşti Cemetery in Chronological and Cultural Context of Southeastern and Eastern Europe. *Eurasia Antiqua* 22, 1–39.

Hansen, S. and Müller, J., eds., 2011. *Sozialarchäologische Perspektiven: Gesellschaftlicher Wandel 5000–1500 v. Chr. zwischen Atlantik und Kaukasus. Internationale Tagung 15.–18. Oktober 2007 Kiel. Deutsches Archäologisches Institut, Eurasien-Abteilung*, Archäologie in Eurasien 24. Mainz: Philipp von Zabern.

Harper, T.K., 2019. Demography and climate in Late Eneolithic Ukraine, Moldova, and Romania: multiproxy evidence and pollen-based regional corroboration. *Journal of Archaeological Science: Reports* 23, 973–982.

Harper, T.K., 2021. The absolute chronology of Tripolye settlements in the Southern Bug and Middle Dnieper regions, c. 4200–2950 BC. *In:* A. Diachenko, T.K. Harper, Y. Rassamakin and I. Sobkowiak-Tabaka, eds. *Data Systematization in the Neo-Eneolithic of Southeastern and Central Europe: Essays in honor of Sergej Ryzhov*. Kyiv: National Academy of Sciences of Ukraine, Institute of Archaeology, 149–161.

Häusler, A., 1994. Grab- und Bestattungsitten des Neolithikums und der frühen Bronzezeit in Mitteleuropa. *Zeitschrift für Archäologie* 28, 23–61.

Ivanov, I., 1988a. Die Ausgrabungen des Gräberfelds von Varna (1972–1986). *In: Fol and Lichardus 1988*, 49–66.

Ivanov, I., 1988b. Das Gräberfeld von Varna – Katalog. *In: Fol and Lichardus 1988*, 183–208.

Kadrow, S., 2011. Kupferzeitliche Sozialstrukturen. *In: Hansen and Müller 2011*, 107–121.

Kadrow, S., 2015. The Idea of Eneolithic. *In:* K. Kristiansen, L. Šmejda and J. Turek, eds. *Paradigm Found. Archaeological Theory. Present, Past and Future. Essays in Honor of Evřen Neustupný*. Oxford: Oxbow Books, 248–262.

Kadrow, S. and Zakościelna, A., 2022a. The origin of the trough retouch in the Lublin-Volhynian culture. *Sprawozdania Archeologiczne* 74(1), 157–186.

Kadrow, S. and Zakościelna, A., 2022b. Eneolithisation from the steppes. Case study: Volhynia. *Światowit* 61, 187–203.

Klassen, L., Pétrequin, P. and Cassen, S., 2011. The power of attraction… Zur Akkumulation sozialwertbesetzter Artefakte im Neolithikum Nord- und Westeuropas. *In: Hansen and Müller 2011*, 13–40.

Klimscha, F., 2016. *Pietrele 1: Beile und Äxte aus Stein. Distinktion und Kommunikation während der Kupferzeit im östlichen Balkangebiet*, Archäologie in Eurasien 34. Bonn: Habelt.

Kolesnik, A.V., 2019. The First Miners of the Donbass. *Vestnik of Saint Petersburg University. History*, 64(2), 599–620.

Lichardus, J., 1991. Die Kupferzeit als historische Epoche: Versuch einer Deutung. *In:* J. Lichardus, ed. *Die Kupferzeit als historische Epoche. Symposium Saarbrücken/Otzenhausen 1988*, Saarbrücker Beiträge zur Altertumskunde 55. Bonn: Habelt, 763–800.

Lichter, C., 2001. *Untersuchungen zu den Bestattungsitten des südeuropäischen Neolithikums und Chalkolithikums*. Heidelberger Akademie der Wissenschaften, Internationale Interakademische Kommission für die Erforschung der Vorgeschichte des Balkans 5. Mainz am Rhein: Philip von Zabern.

Manolakakis, L., 2005. *Les industries litiques énéolitiques de Bulgarie*, Internationale Archäologie 88. Rahden/Westfalen: Verlag Marie Leidorf.

Mączyński, P. and Zakościelna, A., 2017. Flint inventories of Lublin-Volhynian culture burials from sites 1A and 2A in Strzyżów, Hrubieszów district, in light of the

archaeological and traseological analysis. *Sprawozdania Archeologiczne* 69, 327–352.

Mączyński, P, Zakościelna, A. and Bosiak, M., 2023. Macrolithic flint products from inventories of adult male graves of the Lublin-Volhynian culture – prestige goods or everyday use items – by the example of grave no. 2/1987 from site 1C in Gródek, Hrubieszów District (Poland). *Praehistorische Zeitschrift* 98(2), 484–499. https://doi.org/10.1515/pz-2023-2019

Neustupný, E., 2008. Všeobecny přehled eneolitu. *In:* E. Neustupný, M. Dobeš, J. Turek and M. Zápotocký, eds. *Archeologie pravěkých Čech 4.* Praha: Archeologický ustav AV ČR, 11–38.

Nevizánsky, G., 1984. Sozialökonomische Verhältnisse in der Polgár-Kultur Aufgrund der Gräberfelderanalyse. *Slovenská Archeológia* 32(2), 263–310.

Nikitin, A.G., Videiko, M., Patterson, N., Renson, V. and Reich, D., 2023. Interactions between Trypillian farmers and North Pontic forager-pastoralists in Eneolithic central Ukraine. *PLoS ONE* 18(6). https://doi.org/10.1371/journal.pone.0285449.

Popescu, G.M., Covătaru, C., Opriș, I., Bălășescu, A., Carozza, L., Radu, V., Haită C., Sava, T., Barton, C.M. and Lazăr, C., 2023. Sine qua non: inferring Kodjadermen-Gumelnița-Karanovo VI population dynamics from aggregated probability distributions of radiocarbon dates. *Radiocarbon* 65, 463–484. https://doi.org/10.1017/RDC.2023.6

Pozikhovskyi, O. and Karski, K., 2020. Tripolye Culture Chronology in Volhynia. Remarks Based on Materials from Ostrog-Zeman and Mezhyrich-Mistechko. *Baltic-Pontic Studies* 24, 62–86.

Rassamakin, Y., 1999. The Eneolithic of the Black Sea Steppe: Dynamics of Cultural and Economic Development 4500–2300 BC. *In:* I.M. Livine, Y. Rassamakin, A. Kislenko and N. Tatarintseva, eds. *Late prehistoric exploitation of the Eurasiansteppe.* Cambridge: McDonald Institute for Archaeological Research, 59–182.

Rassamakin, Y., 2004. *Die nordpontische Steppe in der Kupferzeit. Gräber aus der Mitte des 5. Jts. bis Ende des 4. Jts. v. Chr.,* Archäologie in Eurasien 17. Mainz: Phillip von Zabern.

Roman, P., 2001. Die Cernavodă III – Boleráz-Kulturerscheinung an der unteren Donau. *In: Studia Danubiana Series Symposia II. Symposium Cernavodă III – Boleráz ein vorgeschichtliches Phänomen zwischen dem Oberrhein und der unteren Donau, Mangalia/Neptun (18–24. Oktober 1999).* Bucureşti: Vavila Edinf, 13–59.

Šiška, S., 1964. Pohrebisko tiszapolgárskej kultury v Tibave. *Slovenská Archeológia* 12(2), 293–356.

Todorova, H., 2002a. Die archäologische Geschlechtsbestimmung. *In: Todorova 2002c*, 53–60.

Todorova, H., 2002b. Schlusswort. *In: Todorova 2002c*, 349–357.

Todorova, H., ed., 2002c. *Durankulak. Band II. Die prähistorischen Gräberfelder von Durankulak*. Sofia: Deutsches Archäologisches Institut.

Todorova, H., 2003. Nairannite trgovski kontakty na Severozapadnoto Prichernomorie. *Dobrudzha* 10, 1–20.

Wilk, S., 2004. Graves of the Lublin-Volhynian Culture at Site 2 in Książnice, District of Busko Zdrój 2001/2002/2003 Exploration Seasons. *Sprawozdania Archeologiczne* 56, 242–260.

Wilk, S., 2006. Graves of the Lublin-Volhynian Culture at Site 2 in Książnice District of Busko Zdrój. 2004 Exploration Seasons. *Sprawozdania Archeologiczne* 58, 247–270.

Wilk, S., 2018. Can we talk about the Copper Age in Lesser Poland? Contribution to the discussion. *In:* P. Valde-Nowak, K. Sobczyk and M. Nowak, eds. *Multas per Gentes et Multa per Saecula. Amici Magistro et Collegae suo Ioanni Christopho Kozłowski Dedicant*. Kraków: Institute of Archaeology Jagiellonian University, 485–493.

Wilk, S. and Kufel-Diakowska, B., 2016. The Lublin-Volhynian culture retouched blade daggers in light of usewear analysis of artefacts from burials at site 2 in Książnice, Poland. *Archaeologia Polona* 54, 137–151.

Zakościelna A., 1996. *Krzemieniarstwo kultury wołyńsko-lubelskiej ceramiki malowanej.* Lublin: Wydawnictwo UMCS.

Zakościelna, A., 2006. Flint Inventory of Grave 5 of the Lublin-Volhynia Culture on Site 2 in Książnice, Busko Zdrój District. *Sprawozdania Archeologiczne* 58, 271–291.

Zakościelna, A., 2008. Wiórowce-sztylety jako atrybuty pozycji społecznej mężczyzn kultury lubelsko-wołyńskiej. *In:* J. Bednarczyk, J. Czebreszuk, P. Makarowicz, eds. *Na pograniczu światów. Studia z pradziejów międzymorza bałtycko-pontyjskiego.* Poznań: Wydawnictwo Poznańskie, 577–591.

Zakościelna, A., 2010. *Studium obrządku pogrzebowego kultury lubelsko-wołyńskiej*. Lublin: Wydawnictwo Uniwersytetu Marii Curie-Skłodowskiej.

Zakościelna, A., Adamczak, K., Garbacz-Klempka, A. and Kowalski, Ł., 2023. A Cucuteni-Vădastra type dagger from site 26 at Strzyżów (S-E Poland) attests to the intercultural landscape of the Eneolithic Eastern Carpathians. *Analecta Archaeologica Ressovienisia* 18, 83–95.

Zakościelna, A. and Libera, J., 2013. Flint raw materials economy in Lesser Poland during the Eneolithic Period. The Lublin-Volhynian culture and the Funnel Beaker culture. *In:* S. Kadrow and P. Włodarczak, eds. *Environment and Subsistence – forty years after Janusz Kruk´s "Settlement studies",* Studien zur Archäologie in Ostmitteleuropa 11. Bonn: Habelt, 275–293.

Zalai-Gaál, I., 2008. An der Wende vom Neolithikum zur Kupferzeit in Transdanubien (Ungarn): Die „Häuptlingsgräber" der Lengyel-Kultur in Alsónyék-Kanizsa. *Das Altertum* 53, 241–280.

The Chance of Monumentality – Case Studies in Western Africa

Luc Laporte

KEYWORDS: *Megaliths, Western Africa, monumentality*

Abstract

Among other perceptions, funerary megaliths have long been presented as the tombs of chiefs from extinct kingdoms, or those of societies with egalitarian ideology. More recently, inequalities in wealth between the instigators of these structures have been highlighted. A few examples in Western Africa show that this form of monumentality is also sometimes rather random, resulting from divinatory processes, from the circumstances of death or from the deaths of individuals with abundant offspring. The singularity of each life course within small groups is thus transposed into the diversity of funeral practices where wealth, proving community investment, can be as spiritual as it is material. Most often, time erases such considerations, but they nonetheless resonate in the interpretation of archaeological remains associated with protohistoric megaliths from Senegal and The Gambia.

Résumé

Les mégalithes funéraires ont longtemps été présentés, tour à tour, plutôt comme des tombes de chefs, fruit de royaumes disparus, ou celles de sociétés à l'idéologie égalitaire. Plus récemment, des inégalités de richesse entre commanditaires ont plutôt été mises en avant. Quelques exemples en Afrique de l'Ouest montrent ce que cette forme de monumentalité doit parfois aussi au hasard, celui issu de procédés divinatoires ou des circonstances de la mort, comme celui qui préside à l'abondance d'une descendance. Au sein de groupes somme toute restreints en nombre, la singularité de chaque parcours de vie trouve alors un prolongement dans la diversité de pratiques sépulcrales où la richesse, justifiant un investissement de la communauté, peut-être tout aussi bien spirituelle que matérielle. Le plus souvent, le filtre du temps efface de telles considérations qui, pourtant, trouvent comme un écho lointain quant à l'interprétation des vestiges archéologiques associés aux mégalithes protohistoriques du Sénégal et de la Gambie.

INTRODUCTION

Very early on in the history of research, the study of megalithic monuments in Western Europe drew on similar studies carried out on other continents, for very different chronological periods. As early as the mid-nineteenth century, Captain R. Galles, who had just explored the large burial mounds in the Carnac region of Brittany, made some cautious comparisons with megalithic monuments in Algeria, where he had just been posted (1869). A few decades later, William Gowland (1899) began by studying the megalithic chambers explored in the Japanese Koffun, before tackling some of the very first archaeological excavations carried out at Stonehenge, in England. Many of the writings describing contemporary populations building megaliths date from the early twentieth century, but the corresponding burial practices, which

touch on the intimate and the sacred, are not always very detailed. Genuine ethnoarchaeological study programs in this field are still rare, and most have only been implemented in the last twenty years. These models are beginning, for example, to take better account of inequalities in wealth (Wunderlich 2019), or differences in the social organisation of groups that nevertheless share the same material culture (Jeunesse 2022). At the present time, kinship relationships attested by relatives for people buried in different stone cists (Jeunesse *et al.* 2021) can be compared with data acquired through palaeogenomics on much older archaeological sites, albeit located on another continent. Conversely, in contemporary times, the absence of a grave for those considered to have died a harmful death, for many human groups and almost everywhere on the planet (Boulestin 2023), also alludes to a treatment of the body that is believed to be detect among Neolithic remains in Western Europe (Schmitt 2023). Curiously, it is much rarer for these same models, developed on the basis of ethnographic or ethnoarchaeological observations, to be first applied to locally available archaeological data. Our own work on the megaliths of Senegal and The Gambia gave us the opportunity to take an interest in contemporary traditional sepulchral practices in West Africa. We will begin with a brief overview of ethnographic work on the subject, before testing a few models derived from this actualist frame of reference that could be applied to archaeological data.

ETHNOGRAPHIC REPORTS AND ACTUALIST REFERENCE FRAMEWORKS

The earliest writings on funerary rites in West Africa concern the margins of trans-Saharan trade, from the ninth century CE onwards for the inland delta of the Niger (Sidibe 1980; Fauvelle 2018), then the coastal areas frequented by European navigators from the second half of the fifteenth century (Becker 1985; Boulègue 2013). But for a long time, vast regions remained closed to foreigners and were only documented by a few travel reports (Mungo Park 1800), particularly from the second half of the nineteenth century (Rançon 1894; Gessain 1963). In the first half of the twentieth century, these populations and their funerary practices began to be described in more detail (Delacour 1912; Sayers 1925; Aujas 1925; Kamara 1933; Techer 1933).[1] In eastern Senegal, central Guinea and southern Mali, as well as in Liberia and Sierra Leone, most ethnographic reports date from 1945 to 1970 (Paulme 1946; Carreira 1947; Germain 1947; Mengrelis 1949; Gaisseau 1953; Holas 1953, Teixeira de Mota 1954; Lestrange 1955; Gessain 1958; Meireles 1960; Jackson 1977), *i.e.*, over a very short period of around a quarter of a century, before these traditions were somewhat drowned out by a new modernity (Journet and Juillard 1989; Iffono 2011, *etc.*). Even today, systematic studies of the practical realities associated with these funerary rites are still very rare (Becker and Marin 1982), and much of the oral literature on the subject has only ever been transcribed in the initiatory language (Faye 1997).

Apart from practices specific to monotheistic religions, traditional funerals generally take place in three stages: entombment, shortly after death, followed by a large public funeral, and then ceremonies so that the deceased attains the status of ancestor. The duration of time between each stage varies, from a few weeks to a few years, and sometimes even longer for the latter (Thomas 1982). The time between the burial and the funeral ceremony is the time required to settle inheritance matters, in some cases, or to collect the goods needed for the festivities. European observers were surprised by the effervescence that swept through the village, as well as by the dancing and the joy that everyone showed on the occasion of these great funerals; undoubtedly the most often described, and sometimes filmed, stage. On the other hand, direct accounts of a burial are much rarer and, curiously, there is often a close correlation between the status of the deceased and that of the foreigners who are allowed to attend.[2] The final stage often took place in a private setting, or in shrines, so it is rarely reported in any real detail other than in monographs, such as that by Madeleine Père (2004) devoted to the Gan of Obiré, in Burkina Faso.

1 A student of Marcel Mauss and after his thesis work in Dahomey (Perlès 2021), Bernard Maupoil was appointed colonial administrator in Youkounkoun, Guinea. An unpublished letter sent to him by Raymond Mauny from IFAN shows that this posting was also intended to enable him to continue his ethnographic work. However, on his return to mainland France and as a member of a resistance network, he was deported during the Second World War. After the war, Monique Gessain only indicates that she planned to publish his notes on the ceremonies associated with the burials of Coniagui chiefs (Lestrange 1955).

2 Such as the burials of childless old women, reported on by young European ethnologists, such as Monique de Lestrange in 1945, Denise Paulme in 1946 or Maria Teixeira in 2002.

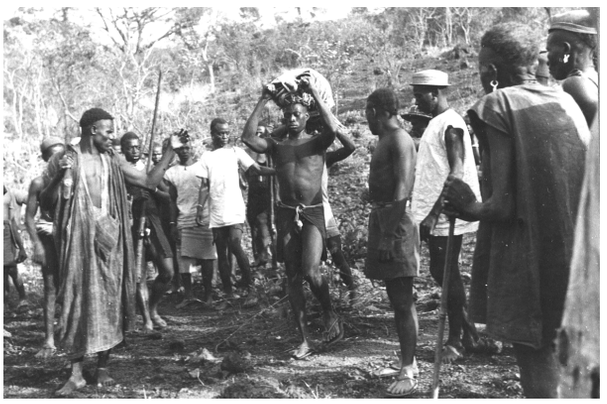


Fig. 1. Interrogation of the dead among the Bassari. Divinatory rites such as these, among many others, had an impact on the way corpses were treated and the associated burial practices (Photo: Monique Gessain 1946. Musée de l'Homme photo library, deposited at the Musée du quai Branly – Jacques Chirac).

All deaths are considered, in principle, to be abnormal (Delacour 1912, 105); none are approached exclusively in terms of strictly 'natural' causes. The search for the cause of death[3] therefore involved divinatory procedures, such as questioning the dead (Fig. 1), which could have an indirect impact on funerary practices; had the deceased practised witchcraft during his lifetime? In this case, the remains would have to undergo specific treatment. Should he or she be buried with a relative deemed responsible for his or her death? And so on. Finally, the biological death of an individual is not strictly opposed to his birth, since his initiation is considered to be an equally important intermediate stage, and this biological death does not always mark the end of the process, since the deceased can sometimes attain the status of ancestor, then spirit, or even genie[4] in some cases (Bloch 1993).

Diversity of funerary practices

Beyond these generalities, what strikes foreign observers the most is the great diversity of funerary rites practised by the same human group. Among the Kpellé of Guinea,

> "*funerals can be reduced to little or even nothing, or involve very complicated ceremonies, depending on the category to which the deceased belongs.*"
>
> (Germain 1984, 182)

The term 'category' used here cannot be reduced to the social status of the deceased, since each death is a special case, and the rites are adapted accordingly.

Not all bodies are necessarily buried. Among the Kissi of Guinea, Denise Paulme (1954) reports that the body of the first child lost by a couple, whatever his/her status among the living or his/her age at death, is thrown without any ceremony in a corner of the forest outside the village, reserved for this purpose. Similarly, a witch who has 'confessed' to possessing a deadly talisman, even post mortem by means of divination, is not always entitled to a burial. This is also the case for children who die before any initiation rites among the Kpellé of Guinea (Germain 1984).[5]

The circumstances of death also give rise to a special treatment of the remains, and here again, regardless of the social status of the deceased during his/her lifetime. Among the Kissi, lepers, and sometimes the blind, are buried outside the village, often along the path leading to the waterhole. Those struck by lightning, the object of the ancestors' wrath, are rejected by the community of the living and the dead, and buried by the side of the path; those burnt by a bushfire are buried at a crossroads. Those whose bodies were found drowned had their graves dug by the river. Sometimes the corpse was even fed to the fish. Sometimes all those who died a hostile death, without distinction (those struck by lightning, lepers, foreigners, the infirm, *etc.*), were buried side by side with the 'first dead' (Paulme 1954). The death of a pregnant woman or one who died during childbirth always gave rise to a complicated ritual, intended to ward off bad luck for the next generation.

The abundance of offspring may also seem to us to be a somewhat random criterion, but in a highly patriarchal and polygamous society, it is indirectly linked to the status of the deceased, if he is a man. Villagers often explain the joy that grips the group at the time of a large funeral, considered as a celebration of the many descendants that the deceased leaves behind. It is

3 Among the causes of death, there was one that caused some confusion among early European observers, often described as human sacrifice. Alfred Delacour (1910) wondered what his Coniagui interlocutors meant by this: did they mean that the individual's premature death was merely announced and considered inevitable, or was it really caused by a third party? Rather than staging a brutal death, the use of poisoning seemed to him to be the most likely hypothesis to hasten what could otherwise take too long to materialise.

4 Ancestors, Spirit and Genie: Genie are more powerful than spirits, and both than ancestors; but these can also be various stage for the Soul of a dead person. See Madeleine Père work onto the Gan People in Burkina Faso (*e.g.* Pere 2004, 544).

5 On the other hand, we do not know what to make of the cases of necrophagy mentioned among the Djola of Casamance during certain initiation rites (Roche 2000, 41).

true that the larger the family, the more wealth can be mobilised. At large funerals, Pierre-Dominique Gaisseau (1953) recounts the sacrifice of many cattle, up to a dozen among the Toma, while Carreira (1947) even narrates the memory of several dozen heads of cattle immolated on this occasion among the Manjak, in Guinea-Bissau (Teixeira 2012). Conversely, an old woman without children will be buried much more discreetly.

However, we know very little about the burial practices reserved for high-ranking dignitaries. In 1948, upon the death of the village chief of Wendekere, near Kissidougou in Guinea, Denise Paulme (1954) reported that once the invocations to the dead man had been completed,

"*everyone was removed. Everyone was ordered to lock themselves up in the huts, and we ourselves were asked, politely but firmly, to step aside. Only the great initiates remained near the tomb*". (Paulme 1954)

Similarly, at the beginning of the twentieth century, Alfred Delacour (1912) merely reported that the tomb of a Coniagui village chief remained open for a fortnight, guarded by the Dyarars day and night, with no one allowed near it. Among the Sereer,

"*if the deceased was an important chief [...], the relatives and followers of the deceased dig a pit in the same hut where the body is and place it there, often in the company of one of his diaraf or jarba who is killed at the same time, so that the deceased can have a companion who will help him pass on his orders*". (Le Mire 1955)

Then a pit is dug near the village,

"*but it is a wooden log covered with a cloth that is placed on the bed and put in the grave. The purpose of this substitution was to prevent the enemies of the deceased from disturbing his rest*" (Le Mire 1955)

in a place that would later be marked by a tumulus mound (*ibid*., 331). The case of an accompanying dead (Testart 2004) is here clearly mentioned, but this is also a case where the body of the main individual is not buried under the monument dedicated to him.

More generally, as in contemporary cemeteries in Western Europe, the reality of burial practices does not always exactly conform to unanimously recognised norms, such as, for the Mandjak in Guinea-Bissau, the presence of a human skull in a healer's hut (Teixeira 2003), acquired on the sly from gravediggers who extract specimens from the grave without anyone knowing.

Primary or secondary, individual, multiple or collective burials

The most detailed ethnographic accounts of the death of a particular person refer to individual burials. This burial generally takes place the day after or a few days after the death. The body of the deceased is placed in a pit with a widened base or a side niche. The mouth of the grave is first closed with logs or perishable materials, then covered with earth.

In principle, and for a while at least, this makes it possible to open the grave again to place the corpse of a new individual in it, which is practised by the Manjak, in Guinea-Bissau:

"*when a person dies, his relatives go to the officiant responsible for the cemetery altar to begin the necessary death rituals. First of all, consulting the entrails of a rooster on the cemetery altar reveals whether or not the deceased has the right to be buried in a new grave dug especially for him/her, or whether they should be buried in a grave dug for a previously deceased person*". (Teixeira 2007, 53)

The fact that the same burial space is used for the corpse of a single individual or for several successive corpses is, in this case, the explicit result of divinatory procedures. When a new deceased person is placed in the relatively narrow grave, the bones belonging to the previous occupants are sometimes rearranged, which, for the archaeologists, bestows a collective burial status on the grave.

A few mentions also suggest the possibility of burial at a later date than the time of death, which implies the use of specific techniques to delay putrefaction. The difficulty here lies in the fact that such practices are only described when they are on the verge of disappearing. Among the Manjak of Guinea-Bissau, for example, Artur Martins de Meireles (1960, 116) mentions the presence of specialists responsible for removing skin from the corpse thirty years earlier. In the Guinea Forest region, the process was more akin to smoking; the food brought for the deceased and left outside the door of the hut was actually used to feed a young man who, for days on end, kept the fire lit under the suspended corpse. There is no doubt that such procedures impact the criteria generally used by physical anthropologists in archaeology to determine whether the body found in the grave decomposed in an empty or a filled in space.

We do not know what to make of indirect references to burying alive slaves, women and sometimes the king himself (Teixeira da Mota 1954, 246). In Guinea-Bissau, Maria Teixeira unequivocally cites cases of incest between a father and his daughter, or between an uncle and his niece:

"*the ascendant, always identified as the offender, will have to dig himself a grave in the bush, in which he will be buried alive.*" (Teixeira 2007, 54)

Similarly,

"*if a man cleared a field without obtaining the desired help from his brothers, he could divert the agnatic inheritance of that land by ritually murdering his uterine nephew. On the spot, the uncle would offer him an appetising meal placed on the edge of a dug-out hole [...], knock him out and throw him into the cavity [...]. When the problem was particularly serious, a niece might be suffocated at the same time as a nephew. In Manjak country, the grave of the child buried alive became a kind of fertilising matrix, a marker of matrilineage, since the altar was built on the very spot where the seed-child had been sacrificed, constituting its foundation.*"
(Teixeira 2004, 199)

Rare cases of secondary burials are only mentioned indirectly. According to the oral tradition recorded by Madeleine Père (2004, 242), the stone tumulus at the centre of the Togo sanctuary is the burial place of Ken-Moro, the first Kaa'iya of the Gan kingdom of Obiré (Burkina Faso), who had died elsewhere beforehand, and to where Queen Kado decided to have his remains transferred. We shall see that the archaeological remains associated with the megaliths of Senegal and Gambia reflect this diversity of possibilities rather than a single norm.

Funerary monuments and necropolises

In Guinea, among the Kissi, the grave is generally dug in the village itself, sometimes under the floor of the deceased's house, which is then abandoned, sometimes under a mound between two houses. The chief may also be buried under the *tungo*, a hut without walls used as a meeting place for the men of the lineage. Denise Paulme (1954) reports that the village chief of Wendekere, who died in 1948, was buried in a grave about 1.30 m deep, in a gallery, so that the dead man would lie under the threshold of the *tungo*, the men's shelter under which his father and an older brother were already buried. A few days after the funeral, a stone taken from the tomb was placed on the ancestral altar (Paulme 1954).

Among the Coniagui, the grave is dug in the bush, in isolation.

"*The corpse is placed in the grave lined with a mat, with the head facing the rising sun in the case of a man, and the head facing the setting sun in the case of a woman.*"
(Lestrange 1955)

The hut of the deceased was then moved to the site of the tomb, which consisted of a mat held upright by a few stakes and topped with a roof made of perishable material. The door opening faces east for a man and west for a woman. A stake is planted in the east, in order to secure the soul of the deceased so that it does not wander among the living while other rites are performed, and the deceased finally joins the world of the dead. This same stake is then moved to the ancestors' altar, alongside those that preceded it (Gessain 2004). It is these same wooden stakes, or *forquilhas de alma* in Guinea-Bissau (such as those found in the royal Manjak necropolis of Pandim) that Raymond Mauny cautiously proposes to compare with the standing stones in a frontal position in Senegambian megalithism (Mauny 1961).

Among the Sereer in Senegal, tombs were grouped together in cemeteries, which sometimes formed veritable fields of tumuli on the outskirts of villages. In 1728, Father Jean-Baptiste Labat, writing about the "Cereres" of Cape Verde, noted that they

"*bury their dead outside their village in round, pointed huts like their own [...], in such a way that it seems to be a second village [...] (the huts of the dead often outnumbering those of the village itself).*"
(see Becker and Martin 1982, 265)

Nowadays, only the roof of the dead man's hut is moved, either placed directly on the ground or placed in a large pit, at the base of which lies the opening of the burial pit (Becker and Martin 1982). The roof is then covered with earth, forming a tumulus;

"*once the young people of the village have laid a first layer of earth to form the tumulus, young people from a neighbouring village may come in turn to increase the height of the mound. They are then given an ox to take with them. Young people from other villages then come to increase the height of the mound, and in turn, they are given an ox. A very large burial mound costs actual herds of oxen.*" (Le Mire 1955, 330)

The construction of the monument was part of an elaborate funeral ceremony, and its size reflected the wealth of the deceased or his family.

Within the funerary plot, other structures also reproduce the image of a house made of perishable material, in a smaller version, and which were often described as ancestral altars by European observers (Fig. 2). Photographs archived in the Musée de l'Homme photo library, now housed at the Musée du Quai Branly, show examples of this among the Sereer of Senegal (at Diakhao, photo Henri Labouret 1929-1933), and the Kissi of Guinea (at Baoua, photo Léon Palès 1948). Their dimensions are similar to ancestral altars built by

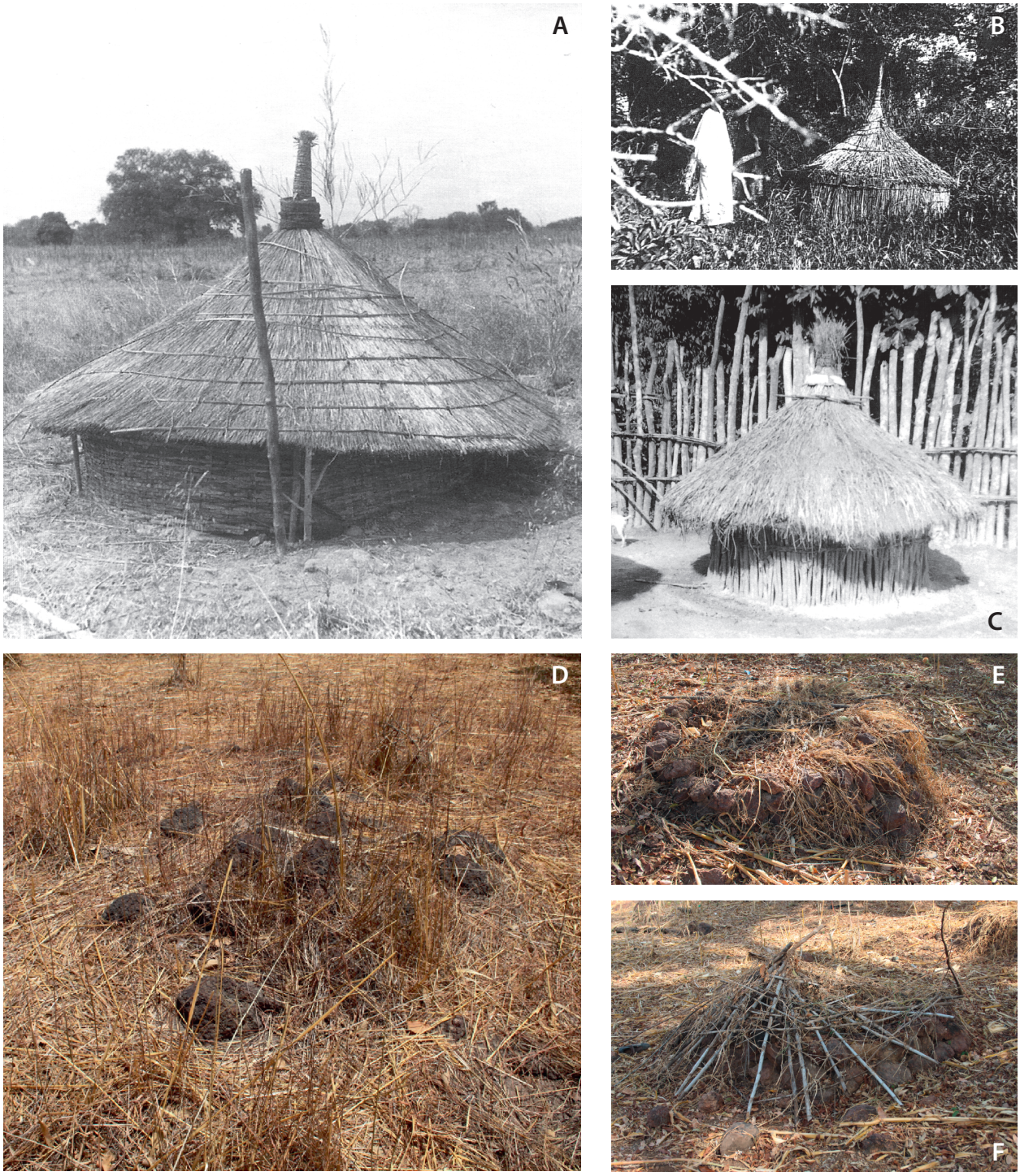


*Fig. 2. From Ethnology towards Archaeology: Houses of the dead and "ancestors' altars". **A** Building constructed over a Coniagui tomb, with the roof of the deceased's hut resting on the upper part of its mat wall, with a stick planted in the ground to the east (after Gessain 2004: 41); **B** "The temple of the ancestors of the dynasty" among the Sereer of Daikhao, in the Fatick region of Senegal (Photo: Henri Labouret, taken between 1929 and 1933); **C** Grave in the courtyard of the village chief's compound, among the Kissi at Baoua, in the Nzérékoré region of Guinea (Photo: Léon Palès, 1948). Similar buildings have been erected on the graves of Bassari village chiefs, whose houses are made of stone. Their ruins are very similar to the small stone circles of Senegambian megalithism; **D** Small stone circle at the Kodiam site (Tambacounda region, Senegal); **E** and **F** Tombs of the two previous village chiefs of Ethiolo (Kedugou Region, Senegal), buried close to their plots (Photos: Luc Laporte).*

the Bassari, in stone. At Ethiolo, Pascal Bindia showed us the ruins of such buildings, very similar to the small stone circles of Senegalese megalithism, on the edge of the cemetery and overlying the tombs of his father, Thiandenine Bindia, who died in 2012, and his grandfather, Singuetack Bindia, who died in 1978, both village chiefs (Laporte 2022). Pascal Bindia attended his father's burial who was buried in a seated position, in accordance with a custom already mentioned by Alfred Delacour a hundred years earlier, with regard to village chiefs. The pit was narrower at the top and wider at the base, with an elongated shape to accommodate the corpse. With a diameter of around 50 cm, the 'altar' of Pascal Bindia's father was built on the same day as his burial, while that of his grandfather was not built until many years later.

There is another place, on the Pathé mountain outside the village of Ethiolo (eastern Senegal), where the tombs of the highest Bassari religious dignitaries in the area, the Allach, are grouped together. We were systematically denied access to this place. Each 'priest's' tomb takes the form of a "*small circular hut with no door, a wall of stacked stones and a conical straw roof*" (Girard 1985, 166), a description confirmed to us by one of the assistants of the present day Allach.[6] Up until then, the existence of this necropolis clearly had to be kept secret, and we do not know whether other similar necropolises exist, for example among the Coniagui, who also speak the Tenda language; "*the highest dignitary in rank is the nemba and above them all is the nemba of Négaré*" (Delacour 1912).

Known only to a few high-ranking initiates, he never appeared in public. The sanctuaries dedicated to the Gan kings Wurkhumbo, in Woogo, and Munyibo, in Nyogtha, in southern Burkina Faso, also take the form of stone houses, juxtaposed in genuine necropolises (Père 2004, 519).

THE ARCHAEOLOGICAL DATA

Some 30,000 standing stones have been identified in Senegal and Gambia, covering an area of around 30,000 km². They make up more than a thousand megalithic circles, most of which also comprise one or more frontally positioned standing stones facing east. Other standing stones are found isolated or at the front of stone circles or stone tumuli, and sometimes also simple tumulus masses (Martin and Becker 1984). However, the vast majority of megalithic circles (around 80 %) are found in a more restricted area, on the north bank of the River Gambia and in the lower and middle valleys of two of its tributaries, the Nianija Bolon and the Grand Bao Bolon, or its tributary, the Petit Bao Bolon. The most northerly megalithic circles are found in the Saloum valley, and several others have been recorded in the upper Sandougou, to the east (Becker and Martin 2021).

Very early on, these circles of standing stones were identified as funerary monuments (Hamy 1904; Duchemin 1905; Todd and Wolbach 1911; Boutonnet 1916). In the early twentieth century, Dr. Pierre Jouenne (1916–1918) gave a fairly detailed analysis of one of the sets of human bones he unearthed at Ndao, under such monuments. Despite some subsequent debates (Parker 1923; Palmer 1939), it was already very clear that these monuments were built by African populations, and that they practised metallurgy (Jouenne 1930). In the 1970s, the work of Guy Thilmans and Cyr Descamps made a major contribution to our knowledge of the corresponding sepulchral practices. Despite the poor state of preservation of the bones, the remains of individual, double or multiple burials were uncovered, and some were interpreted as human sacrifices (Thilmans *et al.* 1980). Subsequent work by Augustin Holl highlighted the existence of secondary deposits, particularly in the western zone of Senegambian megalithism (Holl and Bocoum 2014), with the idea that each monument corresponded to as many 'interim' burials, from among a dozen possible combinations (Holl 2021). Allain Gallay was, however, the first to stress the importance of stratigraphic observations, during the excavation of a tumulus at Mbolop Tobé (Gallay *et al.* 1982), where physical anthropology studies highlighted the successive introduction of several deceased into the grave (Cros *et al.* 2013). Fifteen years later, the same author proposed a new interpretation of the observations made by Guy Thilmans and his team (Gallay 2006), concerning accompanying deaths (Testart 2004). A new periodisation of the associated ceramic material was then put forward, with chronological limits set between the seventh

6 In this case, if the monumentalisation of the place is indeed an indirect reflection of the social status of the deceased during their lifetime, it would be wrong to imagine that it systematically went hand in hand with the most ostentatious practices or the most expensive material goods, generally reserved for village chiefs. Instead, these village chiefs seem to have played an interface role in a world governed far more by spiritual and mystical activity than by everyday events.

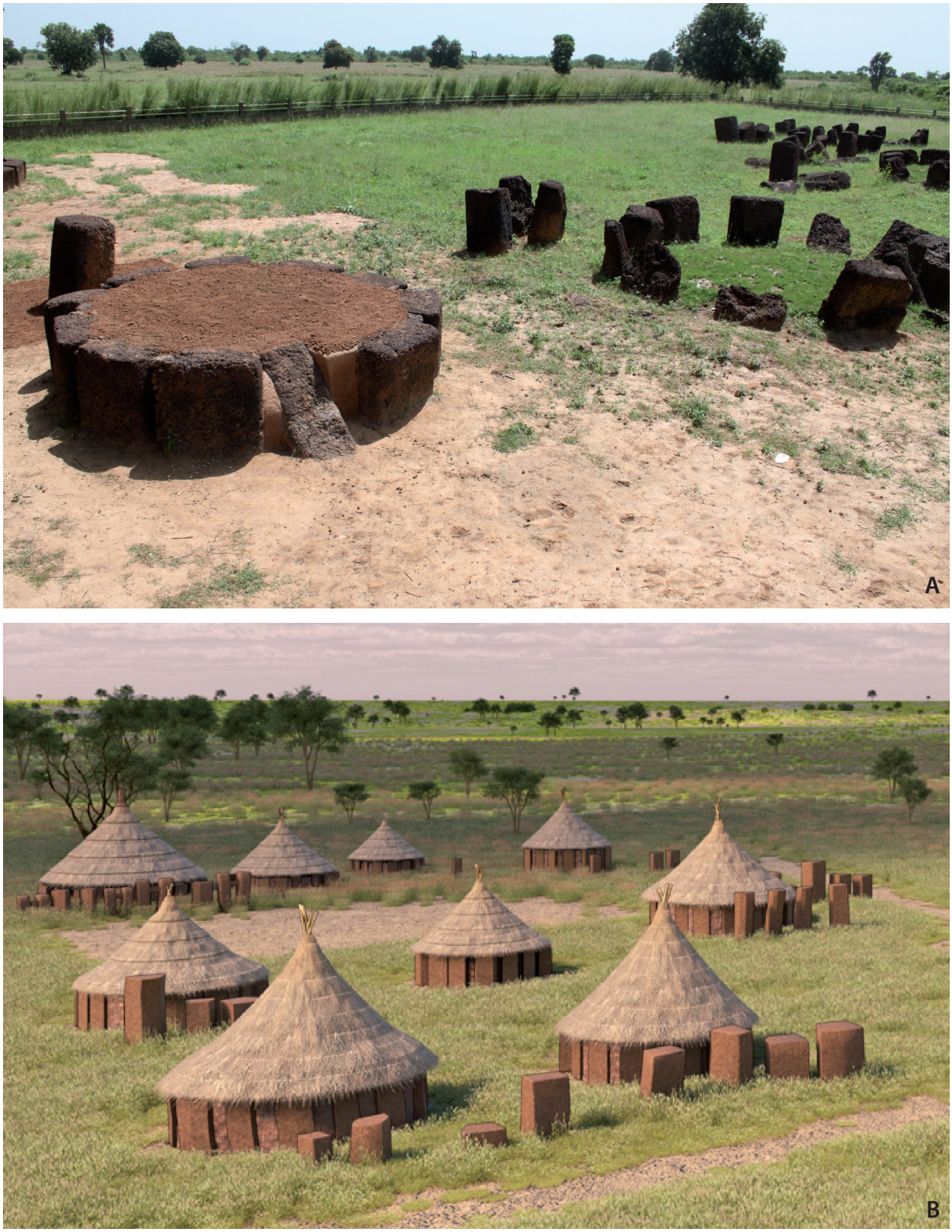


*Fig. 3. Megalithic ruins and houses of the dead: the circles of standing stones, as they appear in the landscape of Senegal and Gambia today (**A**), are the ruins of monuments built in the image of a house of the dead (**B**). **A** Necropolis with megalithic ruins at Wanar (Photo: Luc Laporte); **B** Reconstruction of the first state of the Wanar necropolis around the middle of the eleventh century AD (CAD graphic: Yann Bernard).*

and fifteenth centuries CE (Gallay 2010). To this day, the lack of data about the dwellings of megalith builders is still a major gap in our knowledge.

Our own work on the ruins of the megalithic necropolis at Wanar has led to a real paradigm shift. The detailed observation of the stratigraphy, facilitated by fieldwork carried out at the end of the rainy season, highlights three distinct sequences at the site of each monument; the sequence linked to sepulchral practices is followed by a monumentalisation of the site, where commemorative practices take place, sometimes long after the monument has been ruined (Laporte *et al.* 2018). The placement of stones in a frontal position, and the deposition of ceramics in the façade, sometimes in the form of several successive events, are interpreted more as commemorative rites, including rites enabling the deceased to attain the rank of ancestor (Laporte *et al.* 2015; Delvoye *et al.* 2016). A new periodisation of the ceramic material (Delvoye 2022) will now serve as a regional reference. The study of the architecture first highlights the presence of circular platforms with upright stone facades, joined or separated by dry-stone walls (Laporte *et al.* 2012). The circles dotting the contemporary landscapes of Senegal and Gambia are merely the partly collapsed ruins of initially very different structures (Laporte and Bocoum 2019). The comparison of excavation data with the observation of construction techniques for contemporary vernacular dry-stone dwellings in eastern Senegal enable us to understand that each monument was built in the image of a house of the dead (Fig. 3). The study of charcoal and phytoliths collected in the archaeological layers effectively points to the presence of a roof covered with thatch and with an exclusively hardwood frame (Laporte *et al.* 2017). At Wanar at least, two slightly different types of architecture were built, probably successively, between the mid-eleventh and mid-thirteenth centuries CE (Laporte *et al.* 2022). The builders of megalithic circles in Senegal and Gambia were contemporaries of the empire of Ghana, a little further north (Laporte *et al.* 2024).

The sequence of funerary practices is sometimes particularly complex. At Wanar, as well as revealing burial pits and the level at which they were dug, fieldwork by specialists in physical anthropology, combined with archaeothanatology methods (Duday 1978; 2005), has enabled us to reconsider issues in this area too.

Who were these megalithic funerary monuments destined for?

A few cases of single or double burials, in which the bodies undoubtedly decomposed in an empty space have been identified, either because the grave had not yet been filled in, or due to the presence of a now-disappeared superstructure made of perishable materials (Cros *et al.* 2013). In at least one case, other human remains were introduced into the grave, probably in a container made of perishable material, which disturbed the layout of the leg bones of one of the two individuals previously buried there (Holl and Bocoum 2017). At Wanar, such perishable containers were also deposited at different stages of the filling of the burial pit. These were secondary deposits of human bones. In another case, samples were taken between each deposit, in a similar way to a collective burial. After the mouth of the pit had been sealed by the construction of a platform made of raw earth, other human remains — sometimes dry bones probably contained in a sack — were placed at the same level as the previous deposits by means of a small pit dug at the foot of the platform and featuring a lateral cell. Here again, there are many possible combinations (Laporte *et al.* 2022). Although no one in the region builds megaliths any more, this corresponds to the diversity of sepulchral practices attested in the ethnographic literature for contemporary populations, now located within a radius of 500 km.

There are, however, two intriguing points, the first of which is never mentioned in actualist references, while the second is only mentioned very briefly. Could the large perishable container containing the secondary deposits of human bones, have been the actual burial chamber, secondarily inserted in the tomb? This is a very real possibility, but is only documented by a few photographs taken by Léon Palès in 1946 and Monique Gessain in 1948, in the Coniagui "square of the Dyarars". Successively described in photo captions as a house of masks or a sacred granary, it is a large basket perched almost 2 m high, resting on four vertical piles and topped with a roof (Fig. 4). A Coniagui informant living in Koumpentoum, who was over seventy years old in 2022 and visibly moved by memories of his youth brought back by these photographs, confirmed to us that this was the most sacred place in the village, and that the elders engaged in diverse divinatory practices at its base. However, he was unable or unwilling to tell us what it contained. The interview took place inside the parish enclosure, through interpreters, and the idea that it might contain human bodies was categorically rejected. We deduced from this that, in the eyes of this informant, and not far from the Christian priest, there could be no other norm than individual burial. However, other more indirect informants, Guinean academics working with witches on traditional pharmacopoeia, were much more reluctant to dismiss this hypothesis, which seemed plausible to them, although not proven. In other words, archaeology provides tenacious and recurring material evidence of sepulchral practices, but we cannot determine whether they have

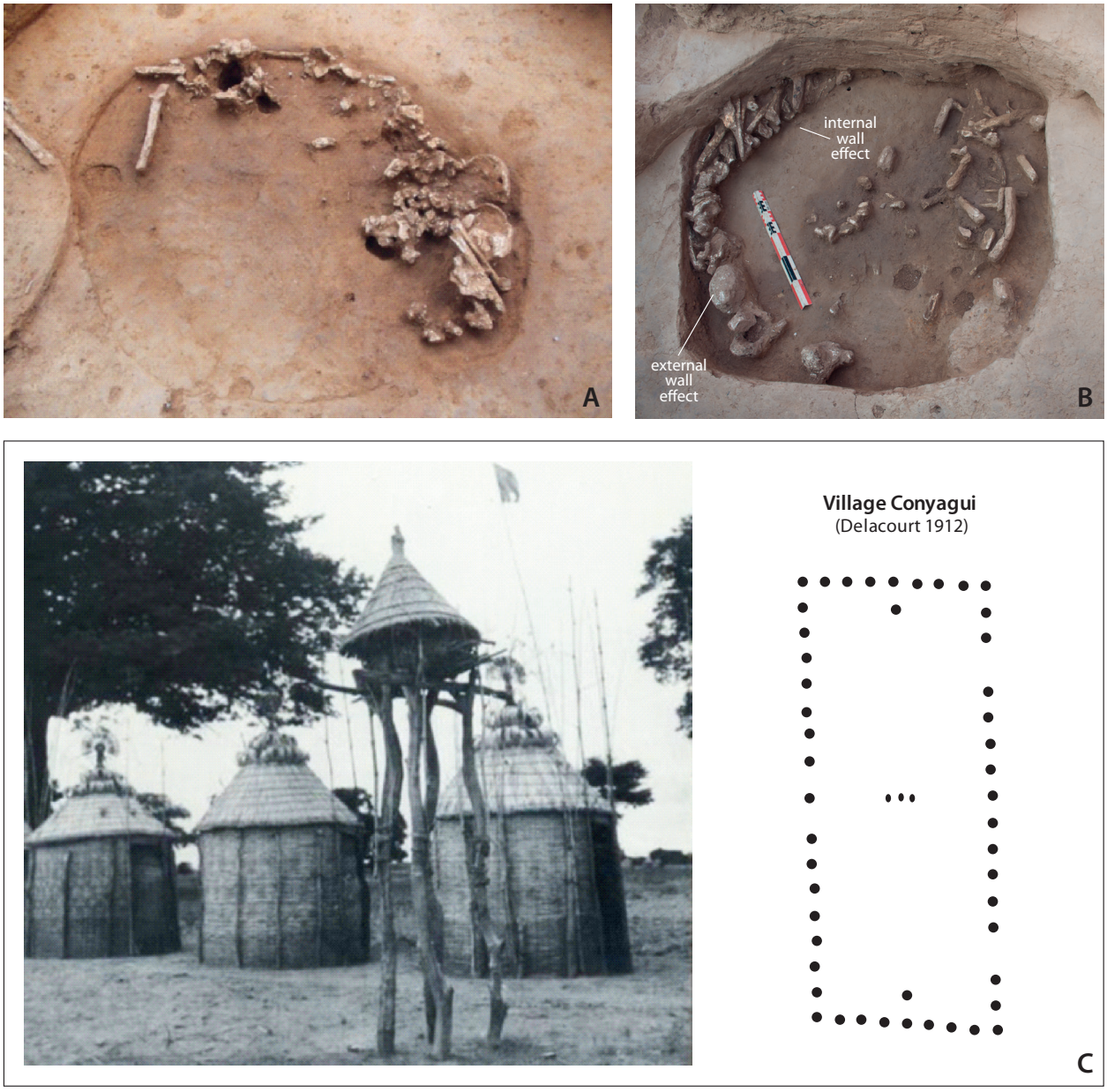


Fig. 4. From Archaeology towards Ethnology: Sepulchral chambers in perishable material deposited in the tomb versus sacred granaries; in the absence of further information on the contents of the latter, the question remains open. ***A and B*** *Secondary deposits of bones in a large container of perishable materials, under monuments II and XX of Wanar, Senegal (Photos: Luc Laporte);* ***C*** *"Sacrificial altar" (according to the caption on the photo), erected in the centre of the square of the Coniagui Dyarars, Guinea (Photo: Monique Gessain 1946), and plan of the Dyarars square (Delacourt 2012) in the center of which this altar stands.*

really disappeared or whether, even today, they remain shrouded in the secrecy of rites reserved for high-ranking initiates.

Another question then arises: are the human remains unearthed beneath the megalithic monuments of Senegal and The Gambia always those of their builders or persons to whom the monument was dedicated? This confusion also arises from the fact that funerary remains are deposited at different times in the filling in of a pit; the pit base often contains no remains. Sometimes, the pit even has a side cell or chamber, the size of a human body, which, at Wanar, was found to be devoid of any bones or grave goods. Are these cenotaphs? Or was the body of the person to whom the funeral was dedicated too precious to be left in a place that would later be marked by the construction of megaliths? We are reminded of Pierre Le Mire's account, in the 1940s, of the funeral of a Sereer chief whose body was replaced by a log, covered by a blanket when he was publicly laid in his grave, which was later

marked by the construction of a tumulus. Is this also how we should interpret the words of villagers who referred to the precise name associated with some of the largest burial mounds in the imposing necropolis of Wago Fall, near Mbacké (Senegal): "*there's nothing left but the dog!*"

Megalithic necropolises

There are some cases where the remains of a high-ranking individual were buried under a megalithic circle, particularly in the megalithic ruins of the necropolises of Tiekene-Boussoura and Kodiam, in the socalled central zone of Senegambian megalithism. These remains were buried at a greater depth than those of several other individuals buried in peripheral positions (Thilmans and Descamps 1974; 1975; Thilmans *et al.* 1980). Due to the state of bone preservation, sexual diagnosis is only rarely possible, and the authors attached little importance in their descriptions to the orientation of the head of the deceased. This deserves to be tested as our Bassari informants indicate, for example, that men's and women's heads face in opposite directions. We also wanted to test another point stemming from the hasty investigations carried out among the Bassari. One, two or three generations of village chiefs are buried as close as possible to the family plot, while the tombs of the highest religious authorities form veritable necropolises. All these tombs are overlain by a structure built like a circular stone house. Could this model guide our research into protohistoric megalithic circles?

The first stumbling block stems from the fact that all the megalithic circles excavated over the last 70 years, at least those that have been documented and published to some extent, belong to necropolises comprising multiple megalithic circles. None of them are isolated circles. A second pitfall is that almost nothing is known about their builders' homes. Nonetheless, the marked disparities in the distribution of megalithic circles in the region in question provide some food for thought. Here, we will concentrate our analysis on the megalithic circles that generally form the central core of the necropolis, around which stone circles, stone tumuli or tumuli with standing stones in a frontal position were also built. There are also isolated standing stones, which will not be taken into account here. There are around a thousand megalithic circles in Senegal and Gambia, spread over some three hundred and fifty sites, out of the two thousand that have yielded megalithic ruins (Fig. 5).

In the east, along the Sandougou valley, 31 sites comprise one or two circles, and only one site counts four megalithic circles. Three-quarters of these are on the north bank. They are evenly spaced, found near the edges of the thalweg or in the associated valley heads. This echoes the layout of contemporary settlements, located at sites with easy access to water. At the confluence with the River Gambia, a little further upstream on the north bank of the river, the Kurau site in Gambia comprises 18 megalithic circles. Fifteen kilometres away, it is flanked by the sites of Diabugu and Baia Dung, each with six megalithic circles, one to the west of Sandougou and the other to the east. This configuration is compatible with the proposed model, with a main sanctuary, two secondary sanctuaries, and the tombs of village chiefs more directly associated with dwellings. Charles Becker and Victor Martin (2021) also report a high percentage of small circles (less than nine monoliths) in the lower and middle Sandougou, similar to the "ancestors' altars" built on the sites of village chiefs' tombs in the actualist reference system (eastern Senegal).

To the north, along the Upper Saloum, the spatial distribution of megalithic circles is fairly similar. The vast majority of circles are isolated on the edges of the thalweg or in the associated valley heads. Out of 20 sites, 18 contain just one circle and one has two, while only the Sorokogne site counts 10 megalithic circles. Unlike the previous case, the isolated circles there are generally large (one-third of the circles are composed of more than 20 stones), whereas half of the circles at the Sorokogne necropolis are small (less than nine monoliths). Although circles with 10 to 19 monoliths account for 71 % of all those recorded in Senegal and Gambia (Becker and Martin 2021), they are rarely found in the upper Saloum valley or in the Sandougou valley. The same observation can be made a little further south, for the upper Nianija Bolon valley, where only two sites comprise more than four megalithic circles: six at Thialène and ten at Tiekene-Boussoura. The density of megalithic circles is also low in the Kountouata valley, which is mainly made up of sites with one or two circles, with the exception of the sites of Kolonto and Kodiam, with six and eleven circles respectively.

From the mouth of the Kountouata to that of the Nianija Bolon, on the north bank of the River Gambia, as in the whole of the lower and middle Nianija Bolon basin, the density of megalithic circles is much higher. This sector is nonetheless dotted with a series of sites comprising one or two megalithic circles, more rarely three or four, with evenly spaced intermediate-sized sanctuaries around ten kilometres apart (5 circles at Buntung and Dingirai, 6 at Patiang, 7 at Kosnan and near Pathé Tianguaye, 8 at Niani Maru, 9 at Ker Batch). Four larger sanctuaries are located on the periphery of this high-density area (19 circles at Pathé Tianguaye, 16 at Kounou Mbayène, 14 at Keur Ali Lobé), or near a confluence (11 circles at Wassu). Sites with one or

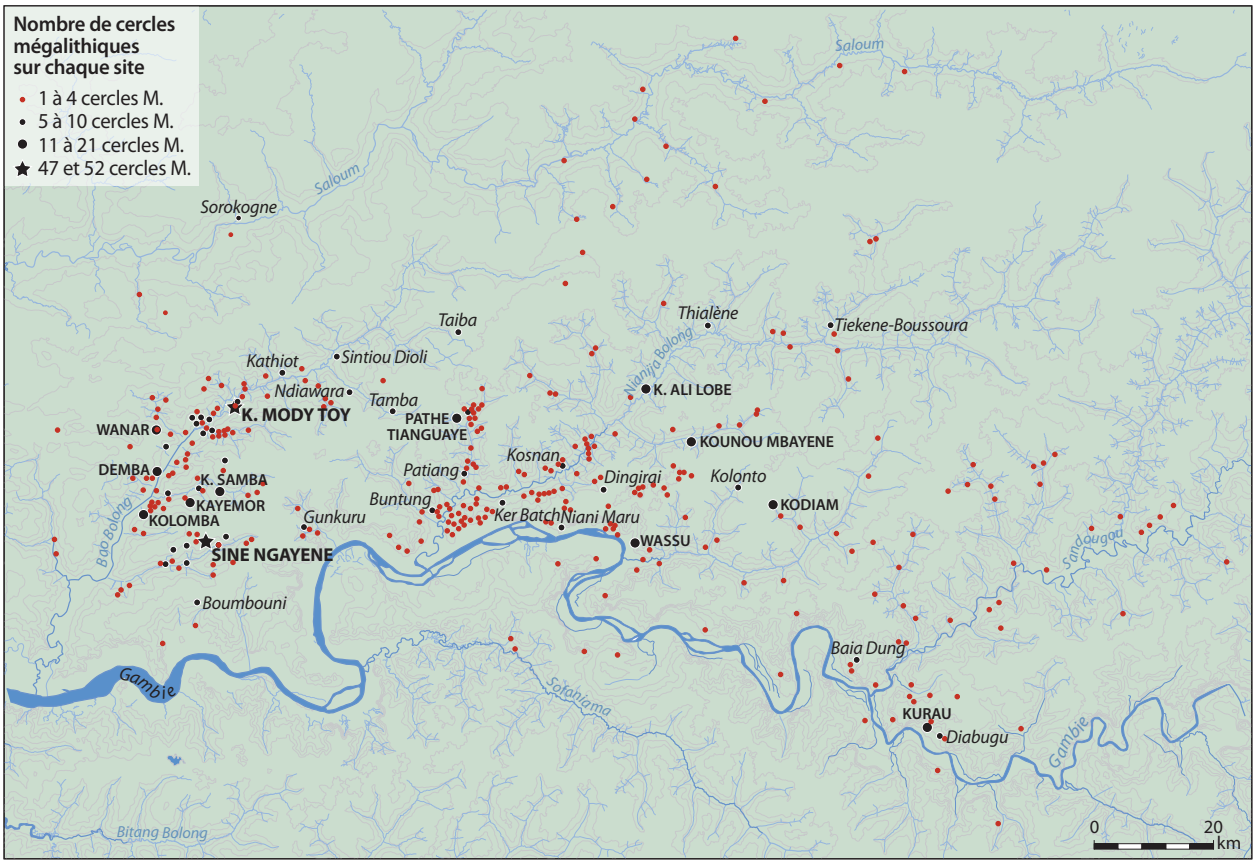


Fig. 5. Geographical distribution of necropolises with megalithic circles in Senegal and Gambia. The structure of the archaeological data is broadly compatible with the actualist model drawn up on the basis of an initial survey carried out at Ethiolo, in Bassari sector (eastern Senegal), except for sites in the basins of the Petit and Grand Bao Bolon (to the west) which, in this small sector, comprise a concentration of half of the thousand recorded megalithic circles (based on data published by Becker and Martin 2021).

two megalithic circles are still predominant, and those with up to four megalithic circles account for over 90 % of the listed sites (2/3 of the number of circles). These proportions are almost exactly the same as those calculated for the cumulative numbers of all the sectors discussed above. Together, they represent half of the thousand megalithic circles recorded in Senegal and The Gambia.

The other half are concentrated in a small geographical area corresponding to the basin of the Petit Bao Bolon and the middle course of the Grand Bao Bolon. Here, sites with just one megalithic circle account for just 30 % of the total (50 % in the lower and middle Nianija Bolon basin, 70 % in the other sectors); those with more than four megalithic circles, on the other hand, account for almost 25 % of the total. The latter contain half of the megalithic circles in this sector, and almost a quarter of all Senegalese megalithic sites. Smaller sanctuaries, comprising between five and ten circles, are particularly abundant; 27 out of 40 are found in this sector. Among the largest sanctuaries, those of Demba Tintin, Keur Samba, Kayemor and Kolomba comprise 13 to 16 megalithic circles respectively, while the Wanar site, which contains a third of all the recorded V-stones, encompasses 21. Two sites contain an unrivalled concentration of megalithic circles: Sine Ngayene (52 circles) in the basin of the Petit Bao Bolon, and Keur Modi Toy (47 circles) just upstream of the middle reaches of the Grand Bao Bolon. Even today, the village located in the immediate vicinity of the latter still has two names, one of which must never be uttered in public, and access to the village can sometimes be restricted, which sets it apart from all the others in the vicinity.

This model, which at least seemed compatible with the spatial distribution of megalithic circles in most of the regions concerned, does not work in the Bao Bolon basin, which is also the sector where the most abundant, most recent and best documented archaeological excavations have been carried out. Compared with the excavations carried out at Tiekene-Boussoura in the upper Nianija Bolon basin, or at Kodiam in

the Kountoutata basin, as well as earlier excavations at Wassu or Ker Batch near the River Gambia, sepulchral practices here appear to be particularly complex and involve the remains of a much greater number of deceased, directly associated with abundant metal grave goods (weapons and adornment) not found in other contexts (Thilmans *et al.* 1980; Laporte *et al.* 2022). Commemorative rites also involve a whole sequence of ceramic deposits that do not necessarily exist further east. These differences, which have too often been interpreted solely in chronological or cultural terms, could just as easily be explained by distinct functions, both in terms of the location of each monument and the status of the deceased.

CONCLUSIONS

In the history of research, the standing stone circles of Senegal and The Gambia were initially interpreted on the basis of references previously developed in Europe, for structures erected in a completely different chronological period (Cros and Laporte 2022). The 2006 UNESCO World Heritage listing of the megalithic necropolises of Sine Ngayene and Wanar in Senegal, and Wassu and Ker Batch in Gambia, presented as little Stonehenges, bears witness to this. A first step in current research consisted in looking for elements of interpretation specific to the geographical area in question, West Africa, based on actualist systems for remains that are only about a millennium apart (Laporte *et al.* 2018; Holl 2021). In this article, we sought to start with what is best known, in the present, in an attempt to develop relevant models for the not-so-distant past in the same geographical area. In return, this comparison has highlighted a number of gaps and uncertainties in the proposed model, and enables us to test its validity before attempting to generalise its use for much more distant populations, from a geographical and chronological, as well as a cultural viewpoint.

Depending on the unearthed remains, archaeologists often tend to extrapolate data from the sepulchral practices observed in a few particularly remarkable places to the entire human group concerned, such as a megalithic necropolis with ruins that leave a lasting mark on the landscape, without always questioning whether they are representative or random. In Senegal in particular, as in West Africa more generally, ethnographic records suggest quite the opposite. Instead, they highlight the great diversity of sepulchral practices within a single human group, often adapted to the particular case of the death of a member of the community. Our Cartesian minds tend to associate many events with chance (circumstances of death, abundance of descendants, divinatory practices, *etc.*), and these events decide whether or not the remains of a particular deceased person will later be found in the burial space of a funerary monument. In light of this diversity observed in West Africa today, we need to reconsider the status of the bones exhumed from beneath the megalithic circles of Senegal and The Gambia, using scenarios that could not even have been imagined for Neolithic megaliths in Europe, for which we have no equivalent references.

On the other hand, archaeologists tend to view the way necropolises functioned as the result of a history specific to each of these sites. For the same type of monument, the fact that the distinction between isolated monuments and those grouped together in a necropolis may correspond to different social statuses is almost never taken into account. Yet this is also what emerges from a rapid overview of the ethnographic literature and our fieldwork. In the context of traditional funeral rites for contemporary societies in Senegal, Mali and Guinea, the grouping of graves in necropolises is far from the most frequent norm, apart from in cemeteries specific to monotheistic religions. A necropolis may be a place reserved for the dead, alongside that of the living, where the memory of some of the ancestors is perpetuated. This is the case of the tumuli necropolis of the Sereer in Senegal. But it can just as easily be a place where anything that could be dangerous or even harmful to the living is grouped together. This is the case among the Kissi people in Guinea, where the hostile dead are sometimes buried together in a necropolis. These two basic ideas are not entirely antagonistic: among the Bassari of eastern Senegal, the same type of monument corresponds to people with different statuses, depending on whether it is built in isolation beside the plot or grouped together within a sanctuary. This actualist model seems relevant and could be tested more widely for Senegambian megalithism, for a past that is only a few hundred years old. It does, however, require us to reconsider what was previously exclusively interpreted in terms of chronological or cultural differences, among the archaeological remains.

The development of actualist reference systems for interpretations proposed by archaeologists undoubtedly paves the way for elaborating models encompassing a wider range of possibilities. But, conversely, when these hypotheses are tested locally, archaeological observations sometimes provide material evidence revealing biases in the proposed actualist models. In the case in hand, such biases seem to have stemmed not only from the external gaze of foreign observers, but also from the sense of secrecy surrounding certain

practices reserved for high-ranking initiates. Much can be learned from such historical perspectives, which can be used to test and refine the proposed actualist model. Seeking out complementary information in each of these two fields of study can give rise to mutual enrichment. This approach, which is all too rarely used, seems to us to be a prerequisite to any temptation to apply such models too hastily to remains deemed to be similar and belonging to totally different geographical or chronological areas. Otherwise, we run the risk of continuing to conclude that

"*The examples presented show, once again, the disconnect that exists between archaeological observations and ethnological interpretations.*"

(Jeunesse and Boulestin 2023, 125)

REFERENCES

Aujas, L., 1925. Funérailles royales et ordre de succession au trône chez les Sérères du Sine. *Bulletin du Comité des Etudes Historiques et Scientifiques de l'A.O.F.* 3, 501–508.

Becker, C., 1985. Histoire de la Sénégambie du XVe au XVIIIe siècle: un bilan. *Cahiers d'études africaines* 25(98), 213–242.

Becker, C. and Martin, V., 1982. Rites de sépulture préislamiques au Sénégal et vestiges protohistoriques, *Archives suisses d'anthropologie générale* 46(2), 261–293.

Becker, C., Martin, V., avec la coll. de Laporte, L., 2021. – Ch. VIII, Répertoire des sites mégalithiques du Sénégal et de Gambie. *In: Bocoum and Laporte 2021*, 207–274.

Bloch, M., 1993. La mort et la conception de la personne. *Terrain* 20, 7–20.

Bocoum, H. and Laporte, L., eds., 2021. *Paysages mégalithiques du Sénégal et de La Gambie, Un patrimoine mondial*, Histoire Générale du Sénégal. Dakar: HGS Editions

Boulègue, J., 2013. *Les royaumes wolof dans l'espace sénégambien (XIIIe–XVIIIe siècel)*. Paris: L'Harmatan.

Boulestin, B., 2023. Des morts privés de funérailles : cadre général de réflexion. *In: Schmitt and Anstett 2023*, 1–21.

Boutonnet, M., 1916. Note de Mr Boutonnet, Administrateur des Colonies. *Annuaire Et Mémoires Du Comité D'études Historiques Et Scientifiques De L'afrique Occidentale Française*, 37–39.

Carreira, A., 1947. *Vida social dos Manjacos*. Lisbonne: Centro de Estudos da Guiné Portuguesa, Bissau.

Cros, J.-P., Laporte, L. and Gallay, A., 2013. Pratiques funéraires dans le mégalithisme sénégambien. Décryptages et révisions. *Afrique: Archéologie & Arts* 9, 67–84.

Cros, J.-P., Laporte, L., 2022. African Megaliths: introduction. *In:* L. Laporte, J.M. Large, L. Nespoulous, C. Scarre and T. Herbet-Steimer, eds. *Mégaliths of the world*. Oxford: Archaeopress, 963–967.

Delacour, A., 1910. Sociétés secrètes chez les Tenda. *Etudes Guinéennes* 1947(2), 37–52.

Delacour, A., 1912–1913. Les Tenda (Konyagui, Bassari, Badyaranké) de la Guinée française. *Revue d'Ethnographie et de Sociologie* (1912) 287–296, 193 and (1913) 31–52, 105–153.

Delvoye, A., 2022. Les traditions céramiques du mégalithisme du Sénégal et de Gambie : une nouvelle périodisation pour l'Afrique de l'Ouest aux Ier et IIe millénaires de notre ère. *Journal of African Archaeology* 20(2), 230–258.

Delvoye, A., Laporte, L., Bocoum, H., Bernard, R., Cros, J.-P., Djouad, S., Dartois, V., Lejay, M., Athie, A., Cisse, F. and Quesnel, L., 2016. L'Art et la manière: Approche technologique des céramiques de dépôt dans le mégalithisme sénégambien – Le cas de la nécropole de Wanar (Sénégal). *Journal of African Archaeology* 14(2), 115–134.

Duchemin, L., 1905. Les mégalithes de la Gambie. *L'Anthropologie* 16, 633–638.

Duday, H., 1978. Archéologie funéraire et anthropologie: application des relevés et de l'étude ostéologique à l'interprétation de quelques sépultures pré-et-protohistoriques du midi de la France. *Cahiers d'Anthropologie* 1, 55–101.

Duday, H., 2005. *Lezioni di archeothanatologia : archeologia funeraria e anthropologia di campo*. Rome: Ecole Française de Rome.

Fauvelle, F.-X., 2018. Ghâna, Mali, Songhay, royaumes courtiers du Sahel occidental. *In:* F.-X. Fauvelle, ed. *L'Afrique ancienne. De l'Acacus au Zimbabwe, 20000 avant notre ère – XVIIe siècle, Mondes anciens*. Paris: Belin, 171–201.

Faye, A., 1997. *Le thème de la mort dans la littérature Seereer. Essai*. Dakar: Les Nouvelles Editions Africaines du Sénégal.

Gaisseau, P.D., 1953. *Forêt sacrée, magie et rites secrets des Toma*. Paris: Albin Michel.

Galles, R., 1869. *Les monuments mégalithiques de basse Bretagne et d'Algérie*, Alger: Paysant.

Gallay, A., 2011. *Les sociétés mégalithiques : pouvoir des hommes, mémoire des morts Le savoir suisse* 37. Lausanne: Presses polytechniques et universitaires romandes.

Gallay, A., 2010. Sériation chronologique de la céramique mégalithique sénégambienne (Sénégal, Gambie), 700 cal BC – 1700 cal AD. *Journal of African Archaeology* 8(1), 99–129.

Gallay, A., Pignat, G. and Curdy, P., 1982. Mbolop Tobé (Santhiou Kohel, Sénégal): contribution à la connaissance du mégalithisme sénégambien. *Archives suisses d'anthropologie générale (Genève)* 46(2), 217–259.

Germain, J., 1947. L'au-delà chez les Guerzé. *Etudes Guinéennes* 2, 27–35.

Germain, J., 1984. *Guinée. Peuples de la Forêt*. Paris: Académie des Sciences d'Outre-Mer.

Gessain, M., 1958. Note sur les Badyaranké (Guinée, Guinée portugaise et Sénégal). *Journal de la Société des Africanistes* 28, 43–89.

Gessain, M., 2004. *Coniagui: Guinée, Sénégal et Gambie. L'histoire d'une diaspora*. Paris: Sépia.

Gessain, R., 1963. Introduction à l'étude du Sénégal Oriental (Cercle de Kédougou). *Cahiers du Centre de recherches anthropologiques, XI° Série* 5(1–2), 5–85.

Girard, J., 1985. *Les Bassaris du Sénégal, fils du Caméléon*. Paris: L'Harmattan.

Gowland, W., 1899. *The Dolmens of Japan & Their Builders*. London: William Clowes & Sons.

Hamy, E.T., 1904. Quelques observations sur les tumulus de la vallée de la Gambie. *Comptes-Rendus de l'Académie des Inscriptions et Belles Lettres* 5, 60–569.

Holas, B., 1953. Décès d'une femme Guerzé. Cercle de Nzérékoré, Guinée Française. *AFRICA* 23(2), 145–155.

Holl, A.F.C., 2021. Construire des mégalithes, produire des ancêtres. *In: Bocoum and Laporte 2021*, 36–75.

Holl, A.F.C. and Bocoum, H., 2014. *Les traditions mégalithiques de Sénégambie*. Arles: Errance.

Holl A.F.C. and Bocoum H., 2017. *Megaliths, Cultural Landscape, and the Production of Ancestors*. Berlin: Éditions universitaires européennes.

Iffono, A.G., 2011. *Naître, vivre et mourir en pays Kissi précolonial. Essai d'anthropologie sociale et culturelle*. Paris: L'Harmattan.

Jackson, M., 1977. The Identity of the Dead: Respects of Mortuary Ritual in a West African Society. *Cahiers d'études africaines* 17 (66/7), 271–297.

Jeunesse, C., 2022. The Social Context Of Megalithic Practice: An Ethnoarchaeological Approach. What The Case Of The Indonesian Island Of Sumba Teaches Us. *In:* L. Laporte, J.-M. Large, L. Nespoulous, C. Scarre and T. Herbet-Steimer, eds. *Mégaliths Of The World*. Oxford: Archaeopress, 341–364.

Jeunesse, C., Boulestin, B., Bec-Drelon, N., Denaire, A., 2021. Ethnoarchaeology Of Funeral Practices: Aspects Of The Management Of Current Dolmens And Collective Tombs In The Tribal Societies Of Sumba Island (Indonesia). *Journal Of Neolithic Archaeology* 23, 6182. https://doi.org/10.12766/jna.2021.3

Jeunesse, C. and Boulestin, B., 2023. Une Etude De Cas Ethnoarchéologique: Le Traitement Des Individus Décédés De Malemort Dans Les Communautés Animistes Actuelles De L'île De Sumba (Indonésie). *In: Schmitt and Anstett 2023*, 118–126.

Jouenne, P., 1916. Les Monuments Mégalithiques Du Sénégal. *Annuaire Et Mémoires Du Comité D'études Historiques Et Scientifiques De L'afrique Occidentale Française*, 27–36.

Jouenne, P., 1917. Les Monuments Mégalithiques Du Sénégal. *Annuaire Et Mémoires Du Comité D'études Historiques Et Scientifiques De L'afrique Occidentale Française*, 311–327.

Jouenne, P., 1918. *Les Monuments Mégalithiques Du Sénégal. Bulletin Du Comité D'études Historiques Et Scientifiques De L'afrique Occidentale Française*, 57–86.

Jouenne, P., 1930. Les Monuments Mégalithiques Du Sénégal: Les Roches Gravées Et Leur Interprétation Cultuelle. *Bulletin Du Comité D'études Historiques Et Scientifiques De L'afrique Occidentale Française*, 309–399.

Journet, O. and Julliard, A., 1989. Interrogatoire Du Mort En Pays Joola Felup. *Systèmes De Pensée En Afrique Noire* 9, 135–153.

Kamara, K., 1933. Kuranko Funeral Customs. *Sierra Leone Studies* 19, 153–157.

Laporte, L., 2022. Mégalithes Du Sénégal Et De La Gambie: Vestiges D'une "Civilisation Disparue" ? *In:* R.-M. Arbogast., A. Denaire , G.-V. Sarka, P. Lefranc, M. Mauvilly and S. van Willigen, eds. *D'oberlag A Wesaluri, Itinéraire D'un Préhistoiren. Mélanges Offerts A Christian Jeunesse*, Mage 8. Strasbourg: Association pour la valorisation de l'archéologie du Grand Est, 323–244.

Laporte, L., Bocoum, H., Cros, J.-P., Delvoye, A., Bernard, R., Diallo, M., Diop, M., Kane, A., Dartois, V., Lejay, M., Bertin, F. and Quesnel, L., 2012. Megalithic Monumentality. *In: Africa: From Graves To Stone Circles At Wanar, Senegal*. Antiquity 86(332), 409–427.

Laporte, L., Delvoye, A., Bocoum, H., Cros, J.-P., Djouad, S. and Thiam, D., 2015. Décorations Et Représentations Symboliques Sur Les Mégalithes Du Sénégal Et De Gambie. *Arqueologia Y Prehistoria Del Interior Peninsular* 3, 334–356.

Laporte, L., Bocoum, H., Delvoye, A., Sanogo, K., Polet, J., Ceesay, B., Cros, J.-P., Athie, A., Djouad, S., Ndiaye, M., Armbruster, B., Ballouche, A., Eichhorn, B., Garnier, A., Lespez, L., Mathe, V. and Robion-Brunner, C., 2017. Les Mégalithes Du Sénégal Et De La Gambie Dans Leur Contexte Régional. *Afrique: Archéologie & Arts* 13, 93–119.

Laporte, L., Cros, J.-P., Bocoum, H., Teixeira, M., Delvoye, A., Ndiaye, M., Djouad, S. and Quesnel, L., 2018. Mégalithes Du Sénégal Et Pratiques Sépulcrales: L'hypothèse De Rites Funéraires Différés. *Journal De La Société Des Africanistes* 88(1), 116–149.

Laporte, L. and Bocoum, H., 2019. Towards Other Atlantic Banks: Reviewing Senegambian Megalithism. *In:* J. Müller, M. Hinz and M. Wunderlich, eds. *Megaliths–Societies–Landscapes, Early Monumentality and Social Differentiation in Neolithic Europe*, Frühe Monumentalität und Soziale Differenzierung 18. Bonn: Habelt, 389–406.

Laporte, L., Lefevre, J.C., Ndiaye, M., Oberlin, C., Delvoye, A., Stern, M., Faye, A.K., Ballouche, A., Cros, J.P., Djouad, S. and Quesnel, L., 2022. Deux Millénaires Ou Deux Siècles De Constructions Mégalithiques Au Sénégal Et En Gambie? Nouvelles Dates Pour Wanar Et Révision Des Contextes Archéologiques. *Afrique: Archéologie & Arts* 18, 53–88.

Laporte, L., Ndiaye, M., Delvoye, A., Cros, J.-P., Ballouche, A., Lamotte, P., Djouad, S. and Quesnel, L., eds., 2024. *La Nécropole Aux Amants Pétrifiés. Ruines Mégalithiques De Wanar (Région De Kaffrine, Sénégal)*. Oxford: Archaeopress.

Lestrange, M. De, 1955. *Les Coniagui Et Les Bassari (Guinée Française)*. Paris: Presses Universitaires De France.

Le Mire, P., 1955. Notes Sur Les Enterrements Sérères. *In:* J. Joire, ed. *Découvertes Archéologiques Dans La Région De Rao (Bas Sénégal)*, Bulletin de l'Institut français d'Afrique noire 17. Dakar: IFAN, 330–332.

Louis-Vincent, T., 1982. *La Mort Africaine. Idéologie Funéraire En Afrique Noire*. Paris: Payot.

Martin, V. and Becker, C., 1984. *Vestiges, Peuplements Et Civilisations Protohistoriques De La Sénégambie. Inventaire Des Sites Protohistoriques De La Sénégambie*, Kaolack: CNRS (Version Revue Et Remise En Forme. Dakar: IFAN 2003).

Mauny R., 1961. *Tableau Géographique De L'ouest Africain Au Moyen Âge, D'après Les Sources Ecrites, La Tradition Et L'archéologie*, Mémoire de L'Institut français d'Afrique noire 61. Dakar: IFAN.

Meireles, A.M. De, 1960. *Mutilações Etnicas Dos Manjacos*. Bissau: Centro De Estudos Da Guiné Portuguesa.

Mengrelis, T., 1949. Funérailles Chez Les Malinké De La Forêt Guinéenne (Nzérékoré). *Notes Africaines* 44, 118.

Mungo Park, M., 1800. *Voyage Dans L'intérieur De L'afrique (Entrepris Par L'ordre Et Sous La Direction De La Société D'afrique Dans Les Années 1795, 1796 et 1797).* Hambourg/Brunswick : P.E. Fauche Et Cie.

Palmer, H.-R., 1939. Stone Circles in the Gambia Valley. *Journal of the Royal Anthropological Institute of Great Britain and Ireland* 69(2), 273–283.

Parker, H., 1923. Stone Circles in Gambia. *Journal of the Royal Anthropological Institute of Great Britain and Ireland* 53, 173–228.

Paulme, D., 1946. La Notion De Sacrifice Chez Un Peuple "Fétichiste" (Les Kissi De La Guinée Française). *Revue De L'histoire Des Religions* 132(1–3), 48–66.

Paulme, D., 1954. *Les Gens Du Riz. Les Kissi De Haute-Guinée*. Paris: Librairie Plon.

Perles, V., 2021. L'expérience De Bernard Maupoil Au Dahomey: entre science et engagement, un laboratoire pour l'ethnologie en milieu colonial. *Gradhiva* 32, 192–216.

Père, M., 2004. *Le Royaume Gan D'obiré. Introduction A L'histoire Et A L'anthropologie. Burkina Faso*. Saint-Maur: Sépia.

Rançon, A., 1894. *Dans La Haute Gambie, Voyage D'exploration Scientifique 1891–1892.* Paris: Soc. D'éditions Scientifiques.

Roche, C., 2000. *Les Bañunou Baïnuk, Histoire De La Casamance. Conquête Et Résistance: 1850–1920*. Paris: Karthala.

Sayers, E.F., 1925. The Funeral of a Kuranko Chief. *Sierra Leone Studies* 7, 19–29.

Schmitt, A., 2023. Identifier Des Morts Sans Funérailles En Contexte Archéologique: Des Cas Datés Du Néolithique. *In: Schmitt and Anstett 2023*, 22–33.

Schmitt, A. and Anstett, E., eds., 2023. *Sans Sépultures, Modalités Et Enjeux De La Privation De Funérailles De La Préhistoire A Nos Jours*. Oxford: Archaeopress

Sidibe, S., 1980. *Archéologie Funéraire De L'ouest Africain. Sépultures Et Rites*. Thèse De 3e Cycle De L'université De Paris 1, Dactylo. Thesis. Paris: Univesity Paris.

Techer, H., 1933. Coutumes Des Tendas. *Bulletin Du Comité D'études Historiques Et Scientifiques de l'Afrique occidentale française* 16(4), 630–666.

Testart, A., 2004. *Les Morts D'accompagnement*, La Servitude Volontaire I. Paris: Editions Errance.

Teixeira Da Mota, A., 1954. *Guinea Portuguesa, Pelo Primeiro Tente*, Mongrafias Do Territorios De Ultramar. Lisboa: Agencia General Do Ultramar.

Teixiera, M., 2003. *Enterrement A Karonkã, Guinée-Bissau*, Karonkã, Novembre 2001. 15 Mn. https://www.Canalu.Tv/Video/Smm/Enterrement_A_Karonka_Rituel_Funeraire_Guinee_Bissau.130 26 ; last access 2nd May 2025

Teixeira, M., 2004. Circulation Des Fluides Et Transformation Des Etres: Les Manjak De Guinéebissau. *In:* F. Héritier and M. Xhantakou, eds. *Corps Et Affects*. Paris: Odile Jacob, 187–203.

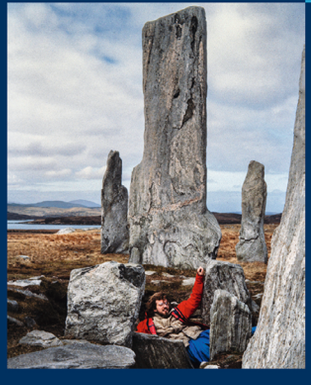
Teixeira, M., 2007. Questionner La Mort Pour Préserver La Vie: Les Manjak Du Royaume De Babok, Guinée-Bissau. *In:* I. Rossi, ed. *Prévoir Et Prédire La Maladie*. Paris: Editions Aux Lieux D'être, 49–66.

Teixeira, M., 2012. Quand Les Morts Sont Célébrés. Les Grandes Funérailles Manjak (Guinée-Bissau). *In:* T.M. Courau and H. De La Hougue, eds. *Rites. Fêtes Et Célébrations De L'humanité*. Paris: Editions Bayard, 1103–1115.

Thilmans, G. and Descamps, C., 1974. Le Site Mégalithique De Tiékène-Boussoura (Sénégal): Fouilles De 1973–1974. *Bulletin De L'institut Fondamental D'afrique Noire* 36(3), 447–496.

Thilmans, G. and Descamps C., 1975. Le Site Mégalithique De Tiékène-Boussoura (Sénégal): Fouilles De 1974–1975. *Bulletin De L'institut Fondamental D'afrique Noire* 37(2), 259–306.

Thilmans, G., Descamps, C. and Khayat, B., 1980. *Protohistoire Du Sénégal : Recherches Archéologiques, 1: Les Sites Mégalithiques*, Mémoires De L'institut Fondamental D'afrique Noire 91. Dakar: IFAN.

Todd, J.L. and Wolbach, G.B., 1911. Stone Circles in Gambia. *Man* 96, 161–164.

Wunderlich, M., 2019. *Megalithic Monuments and Social Structures, Comparative Studies on Recent and Funnel Beaker Societies,* Scales of transformation in Prehistoric and Archaic Societies 5. Leiden: Sidestone Press.